

AN ANALYSIS OF INSTITUTIONAL FACTORS IMPACTING
TIME TO GRADUATION FOR UNDERGRADUATE STUDENTS

By

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The purpose of this study was to analyze the perceptions and attitudes of higher education administrators regarding institutional factors which extend time-to-degree attainment for undergraduate students at a major public research university. After reviewing the literature regarding both educational attainment and time to degree, 28 institutional variables were identified and grouped into four categories: resource allocation, faculty effort, curricular and program issues, and logistical issues. A Likert scale survey instrument was developed to assess the perceptions of department heads concerning how important each of the 28 variables was in extending undergraduate students' time to graduation. The survey was mailed to department heads in the eight undergraduate colleges supported by Education and General funds.

The researcher first analyzed the data by determining the means, standard deviations, and frequency distributions for the 28 individual variables and for the four groups of variables both for all survey respondents and for respondents grouped by college. After compiling these descriptive data, multivariate analysis of variance (MANOVA) was used in determining the significant institutional factors, both individual and grouped, influencing time to degree as perceived by department heads.

Significant differences were found by college for 11 of the 28 individual variables. Significant differences were also found by college in the areas of faculty effort and curricular and program issues.

Five recommendations were made as a result of this study. These recommendations included providing colleges with the flexibility to allocate resources as they deem appropriate; expanding the advising role within colleges; establishing research goals for both revenue production and support and enhancement of teaching; assessing the role of adjunct faculty, instructors, and teaching assistants; and restructuring the curriculum and current delivery systems.

Replication of the current study at different types of higher education institutions is warranted. Additionally, the study should be expanded to include students, faculty, and deans. An in-depth analysis of significant factors identified in this study should be conducted through structured interviews.

CHAPTER I THE PROBLEM AND ITS SIGNIFICANCE

Introduction

In an increasingly competitive global environment, institutions of higher education play an important role in generating and maintaining the nation's professional labor force and in boosting the standard of living in the United States. Many have come to realize that a college degree is a requirement for reasonable employment opportunities in the future. After decades of growth and prosperity, postsecondary institutions faced increasing financial stress and waning public support in the early 1990s. Issues of financial constraint on the part of students, their families, and institutions; accountability; and concern over the outcomes of the undergraduate experience emerged as increasingly important topics in higher education in the decade of the 1980s and remained critical during the 1990s (Knight, 1994).

For public colleges and universities, the nationwide economic slump caused severe restrictions in state appropriations to higher education. The slowdown of the economy which began in the 1980s continued into the 1990s causing many state legislatures to give higher education

spending a low priority. Legislators, taxpayers, students, and their parents put renewed pressure on higher education institutions to document both their efficiency and effectiveness and demonstrate that students were receiving substantial benefits for their investment in higher education. Knight (1994) noted, "An emerging issue manifested by these concerns over the last several years has been the length of time necessary for students to complete bachelors degrees" (p. 3). Federal legislation reflected these concerns. The Students' Right-to-Know and Campus Security Act of 1990 required that all higher education institutions receiving federal funds report graduation rates on an annual basis.

Interest in shortening time to complete a bachelor's degree was a response to productivity and accountability concerns, interpreted in terms of resource allocation and access demands (Blanco, 1994). The phrase, "doing more with less," became widespread throughout higher education. When assessing time to degree,

"doing more" from the state perspective means producing graduates in less time, particularly in high-market-demand fields; it means carrying more students to degree completion for institutions; and for students it means optimizing alternatives that foster completion of the degree in a shortened time period. (Blanco, 1994, p. 1)

Time to degree, rather than rate of degree attainment after a given time period, is an issue worthy of consideration for two primary reasons (Knight, 1994). First, students are interested in how long it will take them to complete a degree so they can plan for tuition expenses,

entry into the labor force, and many other concerns. Second, predicting time to degree provides important planning information for institutions and results in improved estimates of instructional demand and utilization of academic and student support services. For policymakers, interest in evaluating time-to-degree data and practices is high because in many states shortening the length of time to obtain a baccalaureate degree is perceived as an ingredient of improved productivity (Blanco, 1994).

Statement of the Purpose

The purpose of this study was to analyze the perceptions and attitudes of higher education administrators regarding institutional factors which extend time to degree attainment for undergraduate students at a major public research university in the Southeast. In particular, this study assessed the perceptions and attitudes of department heads in undergraduate colleges supported by Education & General funds.

This study answered the following questions:

1. What individual institutional variables and groups of variables extend time to degree for undergraduate students as perceived by department heads?
2. Is there a difference among colleges in the perceptions of department heads regarding individual institutional variables which extend time to degree for undergraduate students?

3. Is there a difference among colleges in the perceptions of department heads regarding grouped institutional variables which extend time to degree for undergraduate students?

Limitations to the Study

The limits of applicability of this investigation are, most strictly, confined to a major Southeast public research university. This study was limited in its analysis to colleges supported by Education and General (E & G) funds which taught undergraduate students.

Results of this study are limited in their generalizability to the selected university because institutional characteristics; resource allocation practices; and curricular, program, and logistical issues are institution specific. The literature (Blanco, 1994; Stoecker, Pascarella, & Wolfle, 1988; Velez, 1985) indicated that campus environment, policies, and practices have significant impact on persistence and completion rates. The very characteristics that make higher education institutions unique such as size, location, composition of the student body, mission, and type of control make the assessment of factors influencing time to degree institution specific. Modifications can be made to incorporate data from other institutions in order to expand the generalizability of the findings. This study provides a broad framework for higher

education institutions to conduct a time-to-degree analysis using institutional variables.

Justification for the Study

Influences on educational attainment, whether or not a student obtains a degree within a given time interval, have been well researched. Initial research focused on how student characteristics impact persistence and graduation rates. Studies (Pascarella & Terenzini, 1991; Porter, 1990; Thomas, 1981; Tinto, 1975) indicated that high school grades, class standing, and SAT scores were the best student characteristic predictors of obtaining a bachelor's degree within a given period of time. Other important student characteristics that influence persistence were race, gender, and socioeconomic status (Garcia, 1994; Knight, 1994; Porter, 1990). The research was mixed on how financial aid influences student persistence.

Institutional characteristics impacting persistence were also the subject of a significant body of research, although the research in this area was more limited than that relating to individual student characteristics affecting persistence and educational attainment. Tinto (1975) noted,

It is the characteristics of the institution--its resources, facilities, structural arrangements, and composition of its members--that place limits upon the development and integration of individuals within the institution and that lead to the development of academic and social climates, or "presses," with which the individual must come to grips. (p. 111)

Institutional characteristics related to educational attainment were size, public or private control, and selectivity. Four-year institutions, private institutions, and high quality institutions had higher persistence and completion rates than 2-year institutions, public institutions, and lower quality institutions (Tinto, 1975). The percentage of PhDs on the faculty and the percentage of resources invested in student services also had an influence on educational attainment (Knight, 1994).

Garcia (1994), in a study of California State University graduates, found that the basic recipe for completing an undergraduate degree within the 4-year template for time-to-degree was to maintain continuous enrollment and earn more than 30 semester units each academic year. He indicated that some characteristics inherent in the student makeup such as gender, age, and ethnic background as well as choices made by students which include selection of a major, special admit, changing of major, undeclared major at time of entry, or enrolling in 12 or fewer units per semester are all predictors of time to degree.

Knight (1994) undertook a time-to-degree study at a state-supported comprehensive university in the Southeast. In his analysis he used the number of quarters of enrollment until graduation as the dependent variable and gender, race, date of birth, major, admissions status, SAT scores, high school GPA, number of courses dropped, total credit hours completed, financial aid status, and whether or not the

student enrolled in an orientation course as independent variables. Knight found that academic ability had the strongest effect, along with cumulative credit hours earned and courses dropped, on time to degree. Age and gender also were found to have a significant effect on time to degree. Additionally, enrollment behaviors such as graduating with considerably more than the minimum required credit hours and dropping courses had strong effects on time to degree.

In the early 1990s, policymakers perceived time to degree as an issue of importance because extended enrollment on the part of students produced a drain on limited resources, particularly when demands for state moneys were many, restricted greater access to postsecondary education, and increased student financial debt (Blanco, 1994). Students and institutions were less interested in shortening the time to degree. Excessive credit accumulation by students produced increased revenue for colleges and universities and provided faculty and departments with filled classes. Students often used their college experience to experiment with different courses to identify a career or individual talents. With the troubled economy, many students used an extended time in college to delay the reality of a difficult job market and debt repayment.

As Knight (1994) noted in the introduction to his study, little if any published research has focused on time-to-degree attainment. Blanco (1994) stated that time to degree is an increased area of research interest for state

policymakers as they focus on resource distribution and increased accountability. Studies on educational attainment and initial time-to-degree studies concentrated primarily on student characteristics. Institutional characteristics over which the administration had limited control such as size, selectivity, and type of control were a focus of limited research. The purpose of this study was to analyze the perceptions and attitudes of higher education administrators concerning institutional factors which extend time-to-degree attainment for undergraduate students at a major public research university in the Southeast. This study looked more extensively at institutional factors influencing time to degree than previous research.

Overview of the Methodology

Descriptive statistics were used to answer research question #1 and to summarize department heads' perceptions of the influence various institutional variables have on extending undergraduate students' time to graduation. Measures of central tendency, mean, median, and mode, and measures of variability, standard deviation, variance, range, and frequency distribution were calculated for each variable for the collective group of department heads and then for department heads by college. After compiling this descriptive data, multivariate analysis of variance (MANOVA) was used in determining the major institutional factors, both individual and grouped, influencing time to degree as

perceived by department heads both within and between colleges. This method of analysis was selected because it allowed the researcher to determine whether several groups, in this case department heads from the eight colleges supported by E & G funds, differed on more than one dependent variable. Borg and Gall (1989) noted, "Groups are likely to differ in some respect because of many interrelated differences in their personal background. MANOVA helps the researcher conceptualize and analyze the nature of multiple influences" (p. 560). This type of statistical analysis enabled the researcher to look at differences among department heads in the same college as well as differences between the department heads in all eight colleges on each of the 28 variables measured by the survey.

Definition of Terms

Educational attainment refers to whether or not students obtain a degree in a given time period.

Time to degree was defined as the number of semesters a student takes to complete an undergraduate degree.

Persistence describes the flow of students through college and has two main dimensions, behavior (enrolled or nonenrolled) and time (when and for how long).

The Education and General (E & G) budget entity covers the ongoing costs of operations for most state-funded programs but does not include auxiliaries, the Institute for Food and Agricultural Sciences (IFAS), or the Health Sciences

Center. For purposes of this analysis, E & G programs refer to undergraduate programs in the following colleges:

Architecture, Business Administration, Education, Engineering, Fine Arts, Health & Human Performance, Journalism & Communications, and Liberal Arts & Sciences.

Summary

This study analyzed the perceptions and attitudes of higher education administrators regarding institutional factors which extend time-to-degree attainment for undergraduate students at a major public research university in the Southeast. The analysis assessed institutional variables extending time to degree as perceived by department heads in eight undergraduate colleges supported by Education and General funds. Comparisons between colleges regarding institutional variables, both individual and grouped, extending time to degree were also incorporated in the analysis. While this study is limited in its generalizability to the institution studied, the research provides a broad framework for conducting a time-to-degree analysis at any postsecondary institution.

CHAPTER II REVIEW OF LITERATURE

Introduction

Higher education researchers have long been interested in undergraduate degree attainment and student enrollment behavior, retention, and persistence. Researchers have also focused on the economic and social outcomes of higher education as measured by the returns to the individual and to society. During the decades of the 1980s and early 1990s this interest was driven by institutional survival needs and by the public expectation that colleges and universities contribute to the economic well-being of our nation by producing a highly trained and skilled workforce. Retention rates and the economic and social investment value of postsecondary education were often used as quality indicators by prospective students, accrediting groups, and funding agencies.

Persistence and retention issues as well as economic and social outcome measurements were more and more in the spotlight during this time period as increased attention was placed on student demographics. Projections concerning the composition of the student body in the future were daunting for higher education leaders. Research conducted in the

early 1990s indicated that by the turn of the century students were likely to be older, non-Anglo, poorer both financially and educationally, and limited in numbers. Changes in the composition of students on campus signified many challenges for college and university leaders. A challenge that received increased attention was time-to-degree rates. Degree completion after 4 years was no longer the norm. Students, parents, policymakers, and higher education administrators had varying interests in the duration of time necessary to complete a baccalaureate degree. Issues of resource constraint, accountability, and outcomes all emerged as important when assessing time-to-degree rates. Both student characteristics and institutional factors interacted to create the extended time-to-degree dynamic present in postsecondary education in the mid-1990s. A significant body of literature exists detailing student factors influencing educational attainment and time to degree; however, the literature concerning institutional factors impacting educational attainment and time to degree is limited. This chapter reviews the literature concerning projected student body demographic information, student characteristics impacting educational attainment, and resource allocation issues related to students. Institutional factors impacting educational attainment, higher education revenue and expenditure patterns, and current time-to-degree studies are then reviewed.

Implications of Student Characteristics on Degree Attainment

Educational attainment is one of the most highly placed values in American society. At both the individual and societal levels, education represents a means for attaining valued goals (Schmitt, 1989). For individuals this means occupational and economic success which provides the basis for our society to remain viable. By the mid-1990s, daunting demographic projections, research on students' persistence and retention behavior, and the changing economics of higher education indicated that graduation in 4 years was no longer the norm for most students attending postsecondary institutions. In an environment where accountability and outcomes assessment were receiving a great deal of attention, higher education leaders were interested in how these factors affected students' decisions to attend college and their movement through the degree process in a timely manner.

Demographic Projections for the College Student Population

The student body attending higher education institutions across the country experienced dramatic changes heading for the turn of the 21st century. Garcia (1994) contended that the changing composition of these student bodies may be responsible for lengthening the actual time necessary to complete a baccalaureate degree program.

At the start of the 1990s, demographic information indicated changes in racial and ethnic composition,

socioeconomic status and family background, age, and gender of the student body. The percentage of the population classified as white declined relative to the percentage comprised of people of color due to low birth rates among whites and changing immigration patterns (Renner, 1993). Population projections indicated that in the period from 1985-2000 the nation's youth population would rise by 2.4 million Hispanics, 1.7 million blacks, 483,000 other ethnic children, and only 60,000 Caucasians (Hodgkinson, 1990). By the year 2000, whites were projected to compose a little more than two-thirds of the pool of college applicants, blacks 17% of the pool, Hispanics 12% of the pool, and Asians about 4% of the pool (Levine, 1990).

The early 1990s saw the socioeconomic status and family backgrounds of students entering higher education also shifting. More and more children were being born into poverty. Hodgkinson (1990) reported almost 15 million children were growing up in single parent homes. Hispanics and blacks, the largest of the nonwhite groups, had the highest rates of poverty and the lowest rates of educational attainment (Levine, 1990).

By the mid-1990s, the number of traditional-age students entering postsecondary education, those in the 18- to 24-year-old cohort, had declined while the population of students over the age of 25 was growing significantly. O'Connor (1994) reported that in 1994 about 43% of all college students were 25 or older. The number of students

over the age of 30 more than doubled in the period from 1974-1994, and growth of 16% was projected by the year 2000 while growth in the traditional student group was projected to remain constant (O'Connor, 1994). Primarily women and minorities comprised the adult learner population described by O'Connor.

Poor academic preparation for the demands of the college environment characterized more and more students leaving high school in the early 1990s. The academic credentials of college-bound high school seniors, as measured by the combined Scholastic Aptitude Test scores, declined from 948 in 1970 to 903 in 1988 (Tinto, 1993). In the early 1990s, high-risk students entered college lacking academic preparation, particularly in subject areas requiring high verbal skills; not of their own choosing; unmotivated, uncommitted, and without basic study skills; and undecided on a career goal (Hardy & Karathanos, 1992). Students classified as high risk were often first-generation college students, had marginal grade-point averages, were in the lower third of their high school graduating class, came from low socioeconomic backgrounds, and suffered from poor self-esteem and self-confidence (Hardy & Karanthos, 1992; McIntire et al., 1992; Schultz, Dickman, Campbell, & Snow, 1992). Students fitting this profile required a great deal of remediation to function successfully in the college classroom. The percentage of students expected to be tutored

while in college rose from 7.8% in 1976 to 15.9% by 1990 (Dey, Astin, & Korn, 1991).

Demographic information indicated that approaching the year 2000 students were likely to be older, non-Anglo, and poorer both financially and educationally. The lower socioeconomic status of students coupled with changes in financial aid policies and a shift from grants to loans made it necessary for many student to work, either full- or part-time, often interrupting or delaying degree attainment. The proportion of students in 4-year institutions attending part-time increased from 26.7% in 1970 to 31.4% in 1989 (Tinto, 1993). The literature on educational attainment indicated that the student population described here was the very group of students that typically experienced persistence and completion difficulty.

Student Factors Impacting Educational Attainment

Personal background factors contribute greatly to a student's enrollment behavior in higher education. Literature on persistence, retention, and dropout indicated several common student characteristics that determine an individual's success or failure in postsecondary education. Tinto (1975) observed,

Individuals enter institutions of higher education with a variety of attributes (e.g., sex, race, ability), precollege experiences (e.g., grade-point averages, academic and social attainments), and family backgrounds (e.g., social status attributes, values climates, expectational climates), each of which has direct and indirect impacts upon performance in college. (p. 94)

The interaction of these factors affects the academic and social integration of students enrolled in colleges and universities. Tinto (1975, 1993) and others (Astin, 1993; Pascarella & Terenzini, 1991; Stoecker et al., 1988) believed this integration was important to students' persistence in postsecondary education.

Porter (1990), in an analysis of persistence and completion rates at 4-year colleges and universities over a 2-year period, defined persistence as the flow of students through college over a 6-year period. He identified four groups of students: (a) completers--those who complete a bachelor's degree, (b) persisters--those who were continuously enrolled, (c) stopouts--those who left and returned, and (d) dropouts--those who left and did not return. Murdock (1987) defined retention as the concerted efforts made on the part of the institution to prevent students from dropping out or withdrawing.

According to several researchers, family background, particularly socioeconomic status, had a significant impact on a student's success or failure in their postsecondary education pursuits (Astin, 1993; Pascarella & Terenzini, 1991; Porter, 1990; Riehl, 1994; Tinto, 1975; Velez, 1985). Tinto (1975) reported that the family's socioeconomic status appeared to be inversely related to dropout. Students from lower status families experienced higher rates of dropout than did students from more affluent families even when intelligence was taken into account. High-income students

were four times more likely to complete college than low-income students (Porter, 1990). Additionally, college persisters were more likely to come from families whose parents were more educated and who placed high expectations for the students' educational achievement (Pascarella & Terenzini, 1991; Riehl, 1994; Tinto, 1975; Velez, 1985). Astin (1993) indicated that students from high-SES families experience more positive outcomes in college, regardless of their abilities, academic preparation, and other outcomes. Generational status, first-generation college goers as compared to students whose parents attended college, also affected educational attainment as expressed in the literature (Porter, 1990; Riehl, 1994). As Riehl (1994) observed, "First-generation college students do not have the benefit of parental experience to guide them, either in preparing for college or in helping them understand what will be expected of them after they enroll" (p. 16). In a study comparing first-generation students with peers whose parents were college educated, Riehl found that the first-generation group had lower SAT scores and high school grades and also demonstrated significantly lower grade-point average expectations, lower academic degree expectations, and a higher frequency of dropout. Additionally, Tinto (1993) reported that students from cultural backgrounds and/or home communities with low rates of educational participation faced potentially severe handicaps in completing degree programs. In trying to do so these students were frequently forced to

reject at least partially membership in communities that had been part of their upbringing.

Since socioeconomic status influenced educational attainment as demonstrated in the literature, it should follow that finances and financial aid also impacted persistence and completion patterns. The question of finances often influenced decisions to attend college as well as which institution to attend in the 1980s and early 1990s given escalating tuition costs. Students must "often weigh the present 'opportunity costs' of a college education, including tuition and deferred income, against the future economic benefits that accrue to those with bachelor's degrees" (Pascarella & Terenzini, 1991, p. 405).

Evidence accumulated over several years indicated that financial aid impacted student persistence (Tinto, 1993). It was difficult, however, to find a causal relationship between persistence and financial aid, and the research in this area yielded mixed findings. Porter (1990) stated that students with grants in their first year were more likely to persist through the first semester of college. Tinto (1993) reported that aided students of low-income origins had rates of persistence comparable to nonaided students from more affluent backgrounds. Pascarella and Terenzini (1991) observed,

If one assumes, however, that students with the fewest financial resources are the most likely to receive general financial aid, then one could conclude that the awarding of financial aid is reasonably successful in accomplishing its purpose. That is by allowing recipients to persist and graduate at a rate equal to

(if not better than) nonrecipients, general financial aid may be at least partially compensating for the negative effects of low socioeconomic origins on educational attainment. (p. 406)

Murdock (1987), in a meta-analysis of 31 research studies analyzing the impact of financial aid on persistence, reached the following conclusions:

1. Financial aid promoted student persistence, although the effect of financial aid was classified as "less than small" but having a significant positive effect.
2. Financial aid had a stronger effect on the persistence of two-year students than four-year students. One factor that may account for this finding was the larger proportion of minority and low SES students attending two-year colleges.
3. Financial aid appeared to have a stronger effect on the persistence of private institution students than on public institution students. The higher cost of private institutions may force students without financial aid to transfer, drop out, or stop out at a greater rate than students receiving financial aid.
4. Financial aid had a stronger effect on persistence during the latter years of college than on the freshman year, particularly in terms of graduation probability. Receipt of financial aid was significant and associated with receipt of the bachelor's degree in four years and graduation from a junior or community college in two years.
5. Financial aid had a greater effect on full-time students than part-time students. (pp. 91-95)

Generally, by the early 1990s, the growing consensus among researchers was that grants and work-study were more effective in promoting persistence than were loans and other forms of aid (Pascarella & Terenzini, 1991; Tinto, 1993).

According to a study conducted by the University of North Carolina (1993), work-study as a form of financial assistance not only provided students with the needed financial

resources necessary for college persistence but also integrated them more fully into campus life, limited students' work hours, and imposed discipline on student schedules. Astin (1993) noted that having an outside job negatively influenced bachelor's degree attainment.

The literature also revealed past educational experiences to be another significant influence on a student's future college performance (Astin, 1993; Porter, 1990; Riehl, 1994; Tinto, 1975, 1993; Velez, 1985). Students who received good grades in high school had a higher predicted probability of finishing college. Astin (1993) revealed that the strongest single predictor of degree completion was the student's high school GPA. Researchers discovered that grades tended to reflect both requisite intellectual skills as well as desirable personal work habits and attitudes (Pascarella & Terenzini, 1991). Standardized test scores provided another good indicator of college performance; high mean SAT scores were significantly related to high 4- and 5-year graduation rates (Gosman, Dandridge, Nettles, & Thoeny, 1983). Velez (1985) found that students enrolled in a college preparatory track in high school had a better chance of finishing college. Porter (1990) determined that college entry paths played a role in completion patterns. Students who entered college immediately after high school had higher completion rates than students who worked or took a few years off before pursuing postsecondary education. While socioeconomic status and academic ability

both affected college persistence, the likelihood of eventually earning a college degree was more strongly associated with measures of individual ability than with socioeconomic status (Tinto, 1993).

Persistence and retention literature also revealed that gender and race had implications for educational attainment. Tinto (1975), in early research on dropout, found that a higher percentage of males finished college degree programs than females. Velez (1985) reached the same conclusion and noted, "A female student's lower odds of finishing college may result from a general cooling-out process that specifically affects women" (p. 199). Schmitt (1989) from the National Center for Education Statistics found the trend for men to graduate from college at a higher rate than their female counterparts to change over time. For the high school graduating class of 1972 males were more likely than females to attain a college degree; however, for the classes of 1980 and 1982 women graduated at a higher rate than men. Tinto (1993) and Astin (1993) confirmed these findings and indicated that females were more likely than males to earn a degree after having begun postsecondary education.

Several researchers found that ethnic group membership impacted educational attainment. Gosman et al. (1983) noted that black students were more likely than white students to withdraw from college and also engage in proportionately more part-time and interrupted schooling, resulting in significantly lower 4-year completion rates. Porter (1990),

in his analysis of completion and persistence patterns, found that the overall completion rates for blacks and Hispanics were approximately one-half of that for whites and Asian-Americans. Hispanics, however, were more likely to still be enrolled and pursuing a degree after 6 years than were black students (Porter, 1990). Tinto (1993) revealed similar completion patterns. However, when controlling for ability and socioeconomic backgrounds, Tinto (1993) discovered that

it is quite apparent that differences in rates of four-year degree completion between persons of different ethnicity but of similar ability or similar socioeconomic status are quite a bit different than those between different ethnic groups overall. Whereas the overall differences in rates of four-year degree completion between white students and Hispanic and black students was about 23 percent, it averaged about 12 percent between white and Hispanic students of similar ability, and about 10 percent between black and white students of similar attributes. (pp. 31-32)

Students' academic choices influenced educational attainment as well. College major exerted significant effects on persistence through its impact on both the academic and social integration of the student (Stoecker et al., 1988). In a study using NLS-72 data, Hill and Owings (1986) found that students majoring in the social sciences, science, or math were more likely to graduate in 4 years than students who majored in business or engineering. Stoecker et al. (1988) revealed that the academic department was an important normative influence on student values, attitudes, and behaviors through contacts with faculty and peers. Pascarella and Terenzini (1991) later discovered that major department contextual factors such as faculty supportiveness

of students, departmental grading practices, and departmental size had a significant influence on educational attainment. These researchers also indicated that limited evidence suggested majoring in the social sciences or humanities indirectly enhanced bachelor's degree attainment by positively influencing grades and informal interaction with faculty. Astin (1993) substantiated these findings and indicated that "retention is positively influenced by majoring in either business, psychology, or other social sciences, and negatively influenced by majoring in engineering" (p. 194). In a study conducted by the University of North Carolina in 1993, researchers noted that many disciplines, especially those in the sciences, experienced an explosion of knowledge in the late 1980s and early 1990s which increased the content and complexity of courses. Students, therefore, carried lower course loads to cope with the increased level of difficulty of these courses.

Several researchers determined that individual intentions regarding participation in higher education and attendance at a specific institution were important predictors of the likelihood of degree completion (Pascarella & Terenzini, 1991; Stoecker et al., 1988; Tinto, 1975, 1993). According to these researchers, both goal and institutional commitment were important for degree completion. The higher the level of one's educational and occupational goals, the greater the likelihood of college completion. In many cases, the goal of occupational attainment became the motivating

force for undertaking and completing a particular academic degree program. One's comfort with the educational environment and a willingness to work toward goal attainment in this environment reflected the student's institutional commitment. The "college fit" theory stated that the greater the congruence between students' goals, values, and attitudes and those of the institution they attend, the greater the probability of successful student performance in terms of persistence and academic achievement (Gosman et al., 1983).

The Economics of Education

In addition to demographic projections and student persistence and retention behaviors, the changing economics of higher education had a strong effect on students' decisions to attend college and their movement through the degree process. The late 1980s and 1990s were a difficult time for higher education and its relationship with the public (Bok, 1992; Hauptman, 1993; Levine, 1992). Colleges and universities experienced significant tuition increases. With these tuition increases, however, higher education did not see a commensurate growth in financial aid (Hauptman, 1993). Colleges and universities charged higher prices with no noticeable change in the services provided causing the American public to become skeptical of higher education's objectives and the efficiency with which institutions fulfilled these objectives (Bok, 1992). Two themes received increased attention in American higher education:

institutional accountability and educational quality (Arkansas State Board of Higher Education, 1993). State legislatures challenged public institutions with new performance based accountability demands. Heavy competition with other government agencies for state funding made it necessary for colleges and universities across the country to demonstrate to lawmakers the value of an education to both the individual and to society.

Time to degree was important in this environment of constrained resources because policymakers perceived too much money was being spent on excess credit hours (Blanco, 1994). Extended enrollment periods meant institutions and states faced increased cost per student and decreased access to degree programs for new students (Blanco, 1994). With high tuition charges and decreased financial aid, students and parents needed information on how long it would take to complete a baccalaureate degree program. Time to degree became a measure of quality, accountability, and productivity. In addition, policymakers, students and parents, and the public were interested in both the economic value of an education and how colleges and universities spent the funds allocated to them.

Any discussion of the value of an education focuses on costs and benefits. The individual and the public have a clear understanding of the financial investments and sacrifices committed to higher education. Indeed, the cost side of the equation gained a great deal of attention in the

late 1980s and the 1990s. During this time period, as the job market became increasingly competitive and employment prospects for college graduates were bleak, both the individual and society questioned their investment in education, and pressure mounted for the benefits of this investment to be better articulated. Productivity demands by policymakers and the public meant the higher education institutions had to make adjustments to increase financial and educational yields on taxpayers' investments (Arkansas State Board of Higher Education, 1993).

Alexander (1993) stated that the benefits of education may be broadly categorized as anything which (a) increases production through income in the capacity of the labor force, (b) increases efficiency by reducing unnecessary costs, thereby reserving resources for the enhancement of human productivity--for example the release of public resources from law enforcement to more productive pursuits--and (c) increases the social consciousness of the community so living conditions are enhanced. (p. 86)

In general, the explanations of a value of an education can be divided into four basic categories: (a) economic value expressed as monetary value to the individual; (b) economic value expressed as monetary value to society, (c) social value expressed as skills, sensitivities, and knowledge provided to the individual, and (d) social value as a contribution to the efficient functioning of society. These four explanations frequently overlap as do the benefits associated with education. These explanations also drive persistence decisions made by students and the growing interest in extended time-to-degree rates.

Monetary value of higher education to the individual

Leslie and Brinkman (1988) and Becker and Lewis (1992) identified three ways to estimate the monetary yield of a college education to the individual: earnings differentials, the net present value of a college education (the present value of a college education after costs are subtracted and corrections are made to adjust for the changing value of money over time), and traditionally calculated private rates of return.

These researchers identified earnings differentials as the most rudimentary approach for estimating the pecuniary value of a college education. The earnings measure indicated how much more, on average, a college graduate earned than other individuals with less education. This measure was easy to understand and to calculate and generally less contentious than more complex measures. A drawback to the earnings differential was that the measure identified only benefits and omitted of costs. Because of this, earnings differentials were of little value when comparing the yield on an investment in education with other investment alternatives. The measure also failed to account for preexisting differences between college attendees and nonattendees.

Despite the weaknesses of this measure, it was widely used as a method for quantifying the value of a college education to the individual. Alexander (1993) reported that in 1972 the income per year of male high school graduates

averaged \$10,433 in comparison to the average yearly income of \$16,201 for male college graduates. In comparative data, Alexander (1993) revealed that the mean annual income for male high school graduates in 1939 was about 60% of the mean annual income for male college graduates; in 1972 the percentage had not changed significantly and stood at about 64%. Leslie and Brinkman (1988) reported that in 1983, for males age 25-34, the median income of college graduates was more than \$6,000 greater than the median income of high school graduates. Weitzman (1991) determined that the average Floridian who attended college for 1 to 3 years and worked 40 weeks in 1989 earned \$1,946 or 15% more than a high school graduate. Pencavel (1991) found that at all ages college-educated males earned 65% more than males who received only a high school diploma. Alexander (1993) noted that while education did not pay as well for black males or for women, as the mean incomes of these groups were significantly lower than white males, all groups realized a substantial rise in income with progressive education. The ratio of median college to high school graduate earnings stood at 1.47 for white males, 1.94 for white females, 1.76 for black males, and 2.04 for black females in 1990 (Becker & Lewis, 1992).

Net present value (NPV) was a second measure for quantifying the economic value of an education to the individual (Becker & Lewis, 1992; Leslie & Brinkman, 1988). Net present value estimated the present value of an education

by subtracting costs from benefits adjusted to reflect the changing value of a dollar over time. A drawback to net present value analysis was the sensitivity of the measure to discount rate selection. Questions often arose over how to determine the discount rate and if the real or nominal interest rate was a better measure. A slight change in the magnitude of the discount rate produced large changes in the size of the net present value.

Cohn and Geske (1990) were the most widely cited for research in this area. The results of their analyses indicated the presence of higher lifetime earnings when a person completed more years of schooling and a lower discount rate was chosen. Based on 1979 data, Cohn and Geske (1990) found that the benefits of education for male college graduates relative to high school graduates were \$60,000, net of foregone earnings. Their research also revealed that for males, the present value of benefits exceeds the present value of costs by \$23,000; for females the difference was only \$7000. A dollar investment in 4 years of college yields, on average, \$1.62 for men and \$1.19 for women in benefits.

By the mid-1990s, the internal rate of return was the most broadly used measure for estimating the value of an education. This measure related total resource costs of education to income benefits and was derived by projecting a lifetime stream of earnings and the costs of attendance. Costs were corrected to current dollars, and the analyst

calculated the interest or discount rate that set the earnings value equal to the cost value. The internal rate of return was the discount rate at which the net present value calculation equaled zero. As mentioned before, net present value analysis was heavily influenced by discount rate selection, while this measure was not. Additionally, the internal rate of return was more widely understood by the general public. Rate of return measures are highly sensitive to cost fluctuations. Because of this, private rates of return to elementary and secondary education were much higher than those to postsecondary education due to the relatively low costs to the individual associated with K-12 schooling.

Rate of return studies became prominent in the early 1960s as a way to quantify education's contributions to both the individual and society. Various studies exist which report the private rate of return for a college education. Hansen reported in 1963 that "the rates of return to education are much higher at the traditional educational plateaus of eighth, twelfth, and college graduate levels. Interval education does not approach these terminal points in payoff" (Alexander, 1993, p. 103). Hancoch found that the relative rate of return to a college education differed by geographic region; return to college education in the North were slightly higher than those in the South (Alexander, 1993). Leslie and Brinkman's (1988) meta-analysis placed the private rate of return to education between 11.8% and 13.4%. Cohn and Geske (1990), in a comparison of several studies,

reported the private rate of return to be between 10% to 15%. Their analysis also reported that the private rate of return was somewhat higher for white males than it was for females and African-Americans. For the United States in the early 1990s, the private internal rate of return was thought to be a percentage in the low teens (Becker & Lewis, 1992).

Comparing data across rate of return studies is often difficult. Leslie and Brinkman (1986) offered this caution:

The results are not strictly comparable because of varying data sources, the populations studied, the time periods reflected, the social and private cost specifications, the controls and adjustments made, the dependent variable specification, the inclusion or exclusion of nonpecuniary or psychic variables, and whether the study was of cross-sectional or time series data. Primarily because of differences in controls and adjustments, the results could not be standardized readily. (p. 214)

The confusion surrounding rate of return methodology made it difficult to compare measures calculated by different researchers.

Researchers expressed several limitations to studies assessing private monetary returns to education. Factors such as individual ability, socioeconomic status and family background, postcollege influences which include on-the-job training, the cost and quality of the institution attended, the occupation pursued upon graduation, and the hours worked while pursuing higher education influenced estimates of private monetary returns to education (Becker & Lewis, 1992; Bowen, 1983; Juster, 1975; McMahon, 1991). As mentioned earlier, gender and race had an impact on the results of studies which analyzed private monetary returns to education.

Monetary benefits of higher education to society

Leslie and Brinkman (1988) and Becker and Lewis (1992) proposed three methods for calculating the economic benefits of education to society. These measures were the social rate of return, growth accounting studies which assess the percentages of national income growth derived from education, and economic impact studies.

Social rates of return were calculated in the same way as private rates of return. This measure differed from the private rate of return in that it used costs to society for supplying educational services in the calculation. These costs, in most cases, were specified as the Educational and General expenditures of institutions plus all or part of the student's foregone earnings; benefits were assessed by the pretax wages and earnings a student accrued over their lifetime (Leslie & Brinkman, 1988). Social rates of return, theoretically, "reflect the private costs of and benefits to those who participate in higher education plus the associated costs and benefits paid and received by others" (Leslie & Brinkman, 1988, p. 75).

Social rates of return were often used to guide policy makers as they make decisions concerning fiscal allocations. Over time, social rates of return have typically been a few percentage points below private rates of return because of the manner in which higher education is subsidized; students pay only a fraction of the total costs of educating them and the remainder is born by society (Becker & Lewis, 1992).

In their meta-analysis, Leslie and Brinkman (1988) found social rates of return to range from 11.6% to 12.1%. Cohn and Geske (1990) in a comparison of several studies reported the social rate of return to range from 11% to 13%. McMahon (1991), in assessing the period 1967-1987, revealed social rates of return ranging from 9% to 15% with a period average of 10.2%. Despite fluctuations in the returns over time, the literature showed internal rates of return to be relatively stable, especially over the long run.

The drawbacks to social rate of return analysis was that the measure excluded both monetary benefits that spill over to others and all nonmonetary benefits of education. The interpretation of social rates of return presented similar limitations to private rates of return and was also highly sensitive to costs.

One approach to overcoming the benefits omissions of social rate of return studies was to analyze the proportion of economic gain attributable to higher education and related activities. National income growth was used as the dependent variable and classic measures of production--land, labor, and capital as the independent variable. Educational outlays were treated as influencing a portion of labor's contribution to the national economy's growth. Social benefits ignored in rate of return studies, namely, improvements in society due to the enhancement of knowledge, improving the quality of the labor pool, and augmenting worker efficiency, were presumed to be included in these studies although they were difficult

to identify (Leslie & Brinkman, 1988). Leslie and Brinkman (1988) clarified,

The relationship between rate of return results and economic growth results by labeling the former as "minimal social rates of return" estimates because they ignore the intangibles, and the latter as "maximum social rates of return" estimates because all contributions of education are said to be accounted for. (p. 80)

Leslie and Brinkman (1988), in a review of 10 estimates or conclusions regarding the percentage contribution of education to economic growth, revealed estimates generally in the 15% to 20% range with approximately one-fourth of this economic growth assigned to education. Becker and Lewis (1992) found that although higher education directly connected to only 4% to 5% of the national income growth, it was probably indirectly linked to another 20% to 40% of this growth. Denison (1985) analyzed data to examine the contributions of education over time to the economic growth of the country. Denison's analysis revealed that in the period from 1948-1973 education accounted for .53 percentage points or about 15% of the growth rate; in the period 1973-1981 this increased by .08 percentage points.

Economic impact studies were designed to measure the increase in a region's economic activity attributable to the presence of a college or university. Economic impact studies were viewed as studies of externalities because they drew attention to the value added by colleges to their communities and prove that social benefits to education do exist. In tough financial times, these studies offered a persuasive

tool for mustering political support for threatened higher education budgets (Elliott, Levin, & Meisel, 1988). Economic impact studies traditionally examined short-term benefits of higher education and did not study the long-term quantifiable investment benefits of education (Leslie & Brinkman, 1988).

The traditional method of economic impact assessment was developed by Caffrey and Isaacs in 1971 and rests on the economic base approach. Studies which modeled the Caffrey and Isaacs framework isolated economic gains attributable to the presence of a college or university. These analyses attempted to factor out consumption activities that merely recycled community funds and focused on economic gains represented by the export of goods and services in exchange for outside revenues.

Utilizing the Caffrey and Isaacs (1971) framework, economic impact studies assessed the impact of postsecondary institutions by measuring the following regional components: the impact on local business, the impact on local government, and the impact on local individuals. The major analytical task of these studies was distinguishing between expenditures representing actual gains to the local economy from those that were recycled funds. Economic impact studies of this nature ignored long-range economic impacts such as the enhancement of workers' skills and the relationship between research and local industry (Elliott et al., 1988). These aspects of the economic impact of postsecondary education

were, in the late 1980s, of increasing interest and importance to state governments (Elliott et al., 1988).

Several problems were associated with these traditional economic base assessments. Of critical importance was the necessity of separating new expenditures and income from those which would have taken place anyway (Elliott et al., 1988). Student spending, in particular, was difficult to categorize. Economic base theory centered on attracting new resources to a community, thus locally derived moneys should not be counted in economic impact studies because these dollars represented only local wealth transfers (Becker & Lewis, 1992; Leslie & Brinkman, 1988). Studies that attempted to quantify the impact of 4-year public institutions on the state economy using this method were the most problematic due to the fact that most financial resources which flowed to these institutions came from the state and should be considered as transfer payments. Few studies attempted to subtract out spending by local students of locally derived institutional revenues.

Despite these shortcomings, economic impact studies were widely used to highlight higher education's economic contributions to society. For community colleges, the type of institution most frequently considered in an economic impact assessment, these studies revealed that the mean business volume to college budget ratio was 1.6, and the jobs created to budget, in millions of dollars, ratio was about 55, expressed in 1988-1989 dollars (Becker & Lewis, 1992).

Leslie and Brinkman (1988) obtained similar findings for 1985-1986. This meant that a community college annual budget of \$10 million generated \$16 million in business volume and created 550 jobs in 1988-1989. For 4-year institutions in the same time period, the business volume to budget ratio was 1.8, and the jobs to budget ratio, in millions of dollars, was 53 (Becker & Lewis, 1992).

An alternative approach to economic impact studies focused on input-output analysis and utilized information about transactions with local industries. A regional input-output model was "designed to estimate the indirect impact of properly and carefully specified direct or initial impact experienced in one or more industry sectors within a region" (Goldstein, 1990, p. 53). Goldstein (1990) used this method to estimate the impact of the University of North Carolina--Chapel Hill's sponsored research budget on the state. He concluded that for fiscal year 1983, the university's total sponsored research funds of \$52.5 million resulted in \$26.6 million in direct in-state expenditures and in \$26.8 million of indirect and induced expenditure in the state economy, yielding a total output impact of \$53.4 million. Goldstein (1990) noted that the drawbacks to this type of economic impact analysis were the time and costs associated because of the enormous data requirements and the failure to account for the nonmonetary stimulus colleges and universities provided to local economies.

Social value of education

The biggest criticism of the measures outlined above was that they ignore the social benefits of education. Writers on higher education finance often assumed that the greatest benefits to a college degree were the personal income gains realized by students. Higher education does, however, provide students with nonmonetary benefits that spill over to society. As Bowen (1983) noted,

Higher education influences many of its students through an ethos that permeates the life and thought of most academic communities. In our time, this ethos includes such ideals as the free mind, individuality, historical and geographic cosmopolitanism, social responsibility, human equality in tension with meritocracy, concern for social issues, and excellence in the arts. . . . These probably lead to an increasing concern for social issues and increasing participation in public and other community affairs, they are favorable to technological and organizational change and improved economic efficiency, they lead to greater international communication and understanding, and they encourage new styles of life. The ultimate effect of these ideals may be to bring about change in basic social institutions and culture patterns. (p. 287)

Justification for investment in education may be found to a great degree in nonmonetary external benefits. Researchers indicated that there are a diverse array of nonpecuniary benefits which appear to be an outgrowth of educational investments.

Weisbrod (1964) defined benefits as "anything which pushes outward the utility possibility function for the society" (p. 17). Weisbrod (1964) included in this definition "(1) anything which increases production possibilities, such as increased labor productivity; (2)

anything which reduces the need to incur costs such as law enforcement, thereby releasing resources for alternative uses; and (3) anything which increases welfare possibilities directly such as the development of public spiritedness or social consciousness of one's neighbor" (p. 17). Total benefits of education as described in his research included both returns to the individual and benefits that spillover into the community in general as a result of individual participation in educational activities.

Singer (1993) noted that education "can be thought of as an item of capital equipment that the student obtains because he expects to receive net benefits whose present value is positive" (p. 38). In addition to the economic benefits which accrue to the student by virtue of his/her education, private benefits of education included "the utility that the student derives from developing basic skills and from broadening his horizons in a way not related to his occupation or income" (p. 41). Singer (1993) recognized that the public, too, benefited from education in the following ways:

1. Education provides students with literacy, familiarity with basic mathematics, and an acquaintance with cultural and political institutions that is essential for minimal participation in economic and political affairs.
2. Education increases the productivity and income of a worker formerly supported by redistribution transfer payments resulting in a reduction in society's tax liability.
3. Incremental education leads to a reduction in crime.

4. Education increases the taxes paid by students as a result of the higher income they earn due to additional training.
5. Education promotes the advancement of knowledge. Basic research may shift the economy's overall production possibility curve outward, making new levels of output attainable without any increase in resource inputs.
6. Education contributes to the overall growth rate of the national economy.
7. Education enables society to provide for future manpower needs by training students with the skills necessary for future economic growth. (pp. 39-41)

As Singer (1993) demonstrated, education was an attractive investment for both the individual and the public.

Alexander (1993) concurred that justification for investment in education was found to a large degree in the nonmonetary benefits. He placed the nonmonetary value of education in three broad categories: family-related benefits, employment-related benefits, and benefits to neighbors and society. Alexander (1993) found that incremental education both increased the productivity of the family and resulted in effectuating positive intergenerational transfers. Alexander (1993) concluded that savings propensities tend to rise with schooling level of the family head. Alexander's research substantiated the findings of both Weisbrod (1964) and Singer (1993) regarding both the employment benefits and benefits to neighbors and society of education. As Alexander (1993) discovered, firms experienced greater productivity by investing more in educated employees. Educated employees appeared to have a favorable impact on their coworkers. Incremental education resulted in the

decline for the necessity of welfare and reduced government expenditures on crime prevention, fire protection, public health, and medical care.

Haveman and Wolfe (1984) recognized that because schooling generates differences valued by people which are not incorporated in earnings differences, standard economic calculations do not fully explain the value of education. These authors listed the following nonmonetary effects of incremental education:

1. Nonwage labor market remuneration in the form of fringe benefits and working conditions.
2. Leisure
3. Individual productivity in knowledge production
4. Nonmarket individual productivity (do-it-yourself)
5. Intra-family productivity
6. Child quality through home activities
7. Own health
8. Spouse and family health
9. Fertility
 - a) attainment of desired family size
 - b) changed tastes for number of children
10. Entertainment--education is consumed for its intrinsic value and to broaden forms of entertainment enjoyed
11. Consumer choice efficiency
12. Labor market search efficiency including migration
13. Marital choice efficiency
14. Crime reduction
15. Social cohesion
16. Technological change
17. Income distribution
18. Savings
19. Charitable giving. (pp. 382-386)

More recently, Knox, Lindsay, and Kolb (1993) confirmed these findings. Knox, Lindsay, and Kolb's work, based on the National Longitudinal Study of the High School Class of 1972 (NLS-72), reported individuals with higher levels of education were more likely to participate in cultural pursuits, to be politically active, to hold educational

attainment as a goal for their children, and to be involved in community activities. As the research demonstrated, the potential nonmonetary benefits of education are many and varied. It would be almost impossible for a single model to capture all of the benefits derived from education.

Institutional Factors Impacting Educational Attainment

While in-depth research existed by the early 1990s testing models of student characteristics and student academic and social integration and the relationship of these factors to persistence, there was scant research on how institutional factors impacted retention. Several researchers found that the characteristics of institutional size, type, control, and selectivity were related to student retention (Stoecker et al., 1988; Tinto, 1975; Velez, 1985). Tinto (1975) stated,

It is the characteristics of the institution--its resources, facilities, structural arrangements, and composition of its members--that place limits upon the development and integration of individuals within the institution and that lead to the development of academic and social climates or "presses," with which the individual must come to grips. (p. 111)

The public-private dynamic and its impact on educational attainment was well researched. Tinto (1975) found that public institutions of higher education tended to have higher dropout rates than private institutions because much of the student selection process took place before entering private colleges, whereas the selection process within the public institutions normally occurred after entrance. Moreover, the

net positive influence that attending a private versus a public college or university had on bachelor's degree attainment was independent of the selectivity of the institution (Pascarella & Terenzini, 1991). Porter (1990) revealed that independent institutions, as a sector, had a substantially higher completion rate than did public institutions, 54.2% vs. 42.7%. Tinto (1993) reported completion rates to be 57.6% for 4-year private institutions and 46.7% for 4-year public institutions. Porter (1990) noted the basic structure of these two types of institutions could contribute to this phenomenon. He reported the average enrollment at 4-year public institutions was 7,626; 14.1% offered only a bachelor's degree. In the independent sector, the average enrollment was 1,437 with 43.3% of these colleges and universities offering only a bachelor's degree. Porter also revealed that differences in mission and size had a profound effect on the structure of an institution and expectations by students, faculty, staff, and the public that make up its community. Additionally, student commitment to the institution was important in accounting for higher rates of degree attainment at private colleges and universities. While differences in completion rates between public and private institutions had always been present, over time and across sectors, rates of 4-year degree completion noticeably declined from 54.8% in 1983 to 50.2% in 1992 (Tinto, 1993).

Tinto (1975, 1993) and Velez (1988) revealed that 2-year institutions had higher dropout rates than did 4-year

institutions. Furthermore, consistent evidence showed initial attendance at a 2-year rather than a 4-year institution lowered the likelihood of obtaining a bachelor's degree (Pascarella & Terenzini, 1991; Velez, 1985). Velez (1985), using the National Longitudinal Study of the High School Class of 1972 (NLS-72), found that net of all other variables, 4-year college entrants had a 18.7% advantage over 2-year college entrants in completing a bachelor's degree within 7 years of high school graduation. Tinto (1975) attributed higher attrition rates at 2-year institutions to lower levels of motivation and academic ability of entering students as well as their socioeconomic status. Velez (1985) credited lower persistence rates at 2-year colleges to the following factors:

1. Students enrolled in two-year colleges were more likely to be exposed to peer influences that encouraged them to leave an academic track for vocational schooling or employment.
2. These students were more likely to have off-campus jobs.
3. Two-year students were more likely to have lowered their achievement goals. (p. 192)

Researchers have suggested that the quality of the college also impacted persistence (Pascarella & Terenzini, 1991; Stoecker et al., 1988; Riehl, 1994; Tinto, 1975, 1993). Pascarella and Terenzini (1991) defined measures of quality as the academic selectivity of the student body as measured by average SAT/ACT scores and high school GPA, institutional resources such as endowment or educational expenditures per student, and prestige and reputational ratings. Riehl (1994)

reported that the best single predictor of student retention is admissions selectivity; colleges and universities with the highest admissions standards tended to have the highest retention rates. Among 4-year institutions, degree completion rates were higher for more selective institutions, both public and private. Tinto (1993) reported degree completion rates for highly selective (SAT > 1100) private institutions at 82.3% in 1992, while completion rates for traditional (SAT 801-930) private institutions were 55.3%. At highly selective public colleges and universities, degree completion rates were 66.2% compared to 45.1% for traditional public institutions. Stoecker et al. (1988) found that net of high school achievement, socioeconomic status, precollege degree aspirations, commitment to the institution attended, and certain collegiate experiences, a measure of student body selectivity and institutional financial resources significantly and positively influenced bachelor's degree attainment. It is important to recognize, however, that "'high quality' colleges start with a distinct advantage in terms of the academic ability, educational aspirations, level and clarity of career ambition, and family financial resources of the students they recruit and enroll" (Pascarella & Terenzini, 1991, p. 374). These initial advantages in the precollege characteristics of students accounted for much of the subsequent advantage shown by selective institutions in student persistence and bachelor's degree completion.

Frequent contact with faculty appeared as a particularly important element in student persistence, especially when these contacts extended beyond the classroom to more informal settings which characterize college life. Tinto (1975) noted that interaction with faculty and administrative personnel played an important role in the student's social integration with the institution. Interaction with faculty also increased the student's institutional commitment and academic integration (Tinto, 1975). He also found that colleges and universities with a greater percentage of faculty with doctorates tended to have higher completion rates (Tinto, 1975).

Current Institutional Revenue and Expenditure Patterns

In the 1980s, American higher education enjoyed a substantial increase in its revenues from each of the major sources of revenues: state and local funding, tuition and fees, annual gifts and endowment income, and federal funds (Hauptman, 1993). The seeming intent of colleges and universities to maximize revenues in the 1980s contributed to the erosion of public trust and confidence in American higher education and set the stage for the push on accountability and the careful scrutiny of resource allocation which occurred in the 1990s (Hauptman, 1993). Postsecondary education leaders focused on increasing quality by spending more instead of spending differently creating the public

perception that program quality and student learning have not kept pace with resource increases (Odden & Massy, 1992).

Hauptman (1993) suggested that the financial issues facing postsecondary institutions in the 1990s could be divided into two basic questions:

1. How do colleges and universities finance themselves?
2. How is the money spent?

From a financing perspective, the most pressing challenge facing public institutions during this era was what to do about state cutbacks brought about by the recession and increased competition for state resources from prisons, health care providers, K-12 education, and other state agencies. For private institutions, the most prominent issue was the question of the limits of the high tuition/high aid strategy that worked so well in the 1980s.

The environment of more limited resources and public accountability pressures on colleges and universities which surrounded higher education institutions in the early 1990s led to considerable concern over how colleges and universities spent the funds they received. While higher education consumers were still interested in the monetary and nonmonetary returns of a college degree, more interest focused on spending patterns and how these spending patterns affected student learning and degree completion. Cost pressures impacting colleges and universities were students shifting into higher cost majors, the impact of new technology, socially mandated programs, and the cost of

borrowing to purchase land, buildings, and equipment (Waggaman, 1991). Colleges and universities responded to these cost pressures in an environment of limited resources by freezing the number of faculty members, allowing the faculty to shrink through attrition, imposing tighter budget controls at all levels of the institution, delaying or deferring renovations of facilities and capital maintenance projects, eliminating marginal programs, and adjusting course offerings each semester (Froomkin, 1993).

Odden and Massy (1992) identified four categories of the cost/productivity/resource allocation debate:

1. The "cost disease" was associated with any activity that was labor intensive. As costs or salaries rise, the cost of the activity also rises. This assumed that faculty salaries must increase to keep education competitive. The "cost disease" also assumed that the way institutions provided services was fixed and did not take advantage of new technology to increase productivity.

2. The "growth force" was the idea that quality costs and that any activity, such as education, has to grow over time in order to increase quality.

3. The "administrative lattice" was the phenomenon of middle managers and staff increasing at a rate faster than front line service providers, in this case, faculty.

4. The "academic ratchet" was the evolution of teaching norms that, over time, produced lower class sizes and teaching loads and more support staff for functions

professors performed in the past, changes which require more resources.

Applying these concepts to higher education provided insight into resource allocation decisions made by colleges and universities in the early 1990s.

Application of the "cost disease" to higher education was straightforward. Odden and Massy (1992) noted,

Higher education is labor intensive. Assuming that teaching is provided by professors and that the student-faculty ratio does not increase over time, it follows that teaching costs will at least rise by an amount equal to the general rise in wages for the economy as a whole, which is usually a combination of both inflation and increases in general productivity. Professors' salaries would need to rise by an amount equal to the inflation rate plus the increase in productivity, in order for higher education to remain competitive. Absent internal efficiency improvements, annual cost increases for colleges and universities, then, would be higher than inflation on the basis of the cost disease alone. (p. 13)

This was the exact behavior colleges and universities engaged in during the 1980s.

Higher education institutions continually tried to expose students to new ideas. As Waggaman (1991) noted, new knowledge, coupled in some cases with the quest for increased academic prestige and stature, led to a need for increased technology, more classes, and the addition of new fields of study while at the same time maintaining traditional paths of study. In an attempt to improve quality continually, the "growth force" caused a "constant layering of new ideas, methods and programs on top of old ones resulting in a constant pressure to add courses, faculty, technology, and facilities to keep pace with expanding knowledge" (Odden &

Massy, 1992, p. 13). The construction or renovation of recreational, cultural, and housing facilities on many campuses contributed to criticism that colleges spend too much money on frivolous items not central to the institution's educational mission (Hauptman, 1993). Much of this activity took place, however, to maintain a "quality" edge.

Growth in revenues in the 1980s led to an increase in administrative staffs on many campuses, referred to as the administrative lattice. Hauptman (1993) noted, "In the 1970s and throughout the 1980s, administrative costs were one of the fastest growing components of higher education expenditures, and administrative staffs grew much faster than the number of faculty" (p. 19). Administrative staffs grew an average of 60% between 1975 and 1985 while faculty increased by an average of less than 6% in the same period (Odden & Massy, 1992; Waggaman, 1991). Higher education leaders defended this growth in administrative staffs by arguing that regulatory burdens resulting from the enactment of environmental, health care, disability, campus crime, and other legislation created a greater demand for staff. Higher administrative costs were also associated with greater staff professionalism and the delivery of better services to students.

Faculty salaries overall increased in real terms in the 1980s, attributed to the catch-up from the 1970s when faculty salaries lagged behind the rate of inflation (Hauptman, 1993;

Waggaman, 1991). Faculty priorities over the last several decades have changed, a phenomenon known as output creep and the academic ratchet (Odden & Massy, 1992). By the early 1990s, faculty no longer devoted the majority of their time to teaching and related activities such as academic advising and mentoring; instead, their primary focus increasingly was research, scholarship, and professional service (Odden & Massy, 1992). Faculty spent more time on research and scholarship because curriculum changes and increases in support staff or faculty/student ratios allowed this flexibility. According to Odden and Massy (1992), colleges and universities paid additional staff to provide advising and counseling services, once the responsibility of faculty. Institutions attempted to improve productivity by substituting lower paid individuals for those with higher levels of expertise. Odden and Massy (1992) stated,

In academic departments, this means hiring graduate teaching and research assistants, administrative assistants, secretaries, and technicians to take over certain faculty functions. Using less costly individuals frees up faculty to devote more time to research and other professional activities. But even less costly individuals require more resources. In most cases, therefore, leveraging faculty time drives up the overall costs of higher education. (p. 16)

"Enacted norms," shared beliefs about the faculty relationship with the environment, as well as curriculum restructuring also had resource allocation implications for colleges and universities. Faculty developed certain "property rights" they felt were inherent in their position such as student/faculty ratios, number of courses taught per

term, the division of teaching between upper and lower division courses, and ideal class size (Odden & Massy, 1992). Property rights had implications for students in terms of when classes were taught, the number of sections taught, and class size. Additionally, colleges and universities moved away from a more structure curriculum to one that provided a large menu of courses, unconstrained by traditional sequence requirements (Odden & Massy, 1992). For students, this lack of structure often meant taking courses unnecessary for degree requirements.

Waggaman (1991) recognized that by the early 1990s competition for a declining pool of undergraduate students had resource allocation implications for colleges and universities. Institutions began spending more money on recruitment activities and expanding facilities and services such as recreational and cultural facilities, student unions, and grounds to make their campuses more attractive to prospective students. Institutions which experienced rising enrollments did not experience a concurrent growth in resources for faculty and facilities (KPMG Peat Marwick, 1989). The number and size of course sections taught did not meet student demand and was often restricted by limited classroom space and the number of faculty available to teach.

Resource limitations in the 1990s meant that colleges and universities could not do as much as they did in the past. Where institutions chose to spend these limited funds had implication for time-to-degree rates.

Time-to-Degree Studies

Issues of financial constraint, accountability, and concern over the outcomes of the undergraduate experience which emerged during the 1980s remained of critical importance to colleges and universities during the 1990s. The proportion of first-time freshmen who earn a baccalaureate degree and the time it takes them to do so are two measures of academic productivity for public universities (Illinois State Board of Higher Education, 1992). Knight (1994) stated, "An emerging issue manifested by these concerns over the last several years has been the length of time necessary for students to complete bachelors degrees" (p. 3). In the past, it was common for higher education institutions to report graduation rates and more so after the passage of the Student Right-to-Know and Campus Security Act of 1990 which mandated that all postsecondary institutions receiving federal moneys report graduation rates on an annual basis. Pressure in the early 1990s, however, shifted the focus from the rate of bachelor's degree attainment to the duration of time required for students to complete their degrees successfully (Knight, 1994). The National Center for Educational Statistics reported that more students were taking longer to graduate than in the past. In a survey of college graduates who completed baccalaureate degrees in 1990, 43% completed their degrees in 4 years or less, and 81% of the 1990 graduates completed degrees within 6 years. The

percentage completing college within 4 years was larger for females than males, for students at private colleges than those at public colleges, and for whites than blacks and Hispanics (Blanco, 1994). Porter (1990) found that only 41% of students in 4-year colleges and universities completed degrees within 6 years. Applying a broader definition of persistence, that is, not dropping out, the persistence rate was 55%. This again showed that time to degree was being extended. An analysis of American College Testing Program (ACT) data indicated that for freshmen entering college in 1986, barely half or 50.2% of all new full-time 4-year college entrants earned bachelor's degrees in their institution of initial registration within 5 years of entry (Tinto, 1993).

Knight (1994) noted that time to degree, rather than rate of degree attainment after a given time period, was important for two reasons. First, student interest was more in how long it would take them to actually complete their degree as opposed to whether or not they would graduate in a given time interval. Predicted enrollment periods could aid students in planning for tuition expenses and entry into the labor force. Second, predictions concerning how long students would be enrolled and if time to degree varied among male and female students, minority and majority students, and variations in student academic ability provided important planning information for higher education administrators. This planning information included improved estimates on

instructional demand, residence hall usage, and utilization of academic and student support services. With the uncertain economic environment of the 1990s, policymakers perceived time to degree as an issue because lengthened enrollments produced a drain on limited resources, restricted greater access to postsecondary education, and increased student financial debt (Blanco, 1994).

The Illinois State Board of Higher Education (1992) reported that

excessive time to degree has direct cost implications for students and families in the form of additional tuition and fees and the indirect costs associated with foregone income. From the campus perspective, high attrition and time-to-degree rates can lead to enrollment imbalances between lower- and upper-division levels, less than optimal class sizes, and low full-time-equivalent to headcount enrollment ratios. Each of these effects, in turn, have costly staffing implications. Excessive time to degree may also increase institution and state-funded student financial aid resource requirements. (p. 3)

The report further stated that productivity challenges for colleges and universities associated with time to degree were to understand better what factors contributed to lengthy time-to-degree rates. Administrators must assess what can be done to improve time-to-degree rates without adversely affecting access and diversity and maintaining and strengthening the quality of education.

According to Blanco (1994), the issue of time to degree had several dimensions:

1. Students were often not prepared to do college-level work.

2. Students were disinclined to move along because they knew they would have a hard time finding a job and starting loan payments.
3. Institutions had too many demands for too few resources.
4. Institutions were disinclined to push students faster because of negative impact on revenue and because students filled courses for faculty members.
5. The state was inclined to encourage students to finish in four years or less because extended time to degree increased costs and decreased access to a degree for other students. (p. 6)

In a study of time to degree at Iowa's public universities,

KPMG Peat Marwick (1989) reported that

changing expectations with respect to degree completion in specified time frames (such as four years) may be related to a general opening up of the educational environment, expansion of general studies and life-long learning programs, a greater willingness on the part of institutions to serve non-traditional populations (persons older than 18-22 years) at the undergraduate level, and the generally accepted cultural recognition that most people will have more than one "career" in their lifetime. (p. 10)

As Knight (1994) noted in the introduction to his exploratory study on time to degree, in the early 1990s, little, if any, published research focused on time-to-degree attainment. What literature did exist was generally institutional or coordinating board self-assessments. Several factors which lengthen time to degree emerged through these institutional studies (Blanco, 1994). These included the following:

1. Poor job market for graduates
2. Working part time or full time while studying
3. Family or other personal concerns
4. Number of credits required for graduation
5. Number of credits accumulated before graduation
6. Changing majors
7. Course drop/add policies

8. Advising
9. Transferring among institutions
10. Insufficient financial assistance/financial status of the family
11. Limited access programs at the upper division
12. Loss of credits in transferring
13. Inability to register for courses needed
14. Readiness for college/need for remediation. (p. 5)

A review of several studies provided insight into these factors. Due, in part, to the recent development of time-to-degree analysis, most studies reviewed focused on student characteristics and behaviors rather than institutional policies and practices. This was not considered unusual as studies of dropout behavior looked more heavily at student characteristics rather than institutional variables (Tinto, 1975). Blanco (1994) noted that, in addition to graduation rates, relevant information to examine in time-to-degree analyses included course loads, precollege preparation of students, admissions scores, course demand/availability analyses, program requirements, availability of technological enhancements, advanced standing at entry, upper division limited access programs, number of majors and change of majors, and transferability of courses.

In an early study, Thomas (1981) analyzed student and institutional characteristics as determinants of the prompt and subsequent 4-year college graduation of race and sex groups. She defined prompt graduation as earning a bachelor's degree in 3 to 4 years and subsequent graduation as completing an undergraduate program by the 7-year mark. Her study focused on black and white, male and female students who entered 4-year colleges after high school

graduation in 1972 or 1973. Thomas (1981) found that, in general, black students were less successful than white students and males less successful than females in completing degree programs in 4 years. The same was true for 7-year completion rates. High school rank was an important determinant of prompt graduation for white males and of prompt and subsequent graduation for black females. Students completing a degree program in 4 years had significantly higher SAT or ACT scores than nongraduates or those student taking longer than 4 years. Attending a private college effected prompt college graduation for white and black males but had no significant relationship for females. Thomas discovered mixed effects of socio-economic status (SES) on timely completion. While SES seemed a major determinant of college entry, the impact on completion appeared minimal in some cases. In other cases, SES had a significant impact on college graduation. Thomas (1981) concluded that college grade performance was among the strongest predictors of prompt graduation; maintaining a high GPA was critical for college success.

KPMG Peat Marwick conducted an analysis of time to degree at Iowa's public universities in 1989 which revealed that extra-institutional factors, institutional factors, and personal factors all contributed to extended time to degree. Extra-institutional factors consisted of the social, cultural, and economic circumstances which shape the environment of higher education in America. During the

Reagan administration, the landscape of federal financial aid shifted from grants to loans and placed the burden for support for education largely upon parents and students. Personal factors influencing time to degree discussed in this study were the student's desire to complete a degree, academic progress, course selection, major selection, employment during college, full-time versus part-time attendance, and enhanced education.

The Iowa study gave considerable attention to institutional factors impacting time to degree. The researchers noted institutional factors such as degree requirements, course offerings and major availability, access to courses, course scheduling, advising, and curricular expansion were all aspects of degree completion over which the institution had control and which, if managed effectively, could reduce time to degree. It was noted in this study that most degree programs required 124 credit hours. For students to graduate in 4 years, they must take, on average, 15.5 credits per semester, yet full-time status was 12 credits per semester. Course offerings and major availability also created problems for students in completing degree programs in 4 years. The need to take remedial courses, prerequisite requirements for certain programs, and strict admissions requirements for limited access programs all created hurdles for students, as revealed in this report. Additionally, curricular flexibility also contributed to extending students' time to graduation. Some programs are

extremely structured due to requirements imposed by the state or external agencies. If a student fails or misses a course, graduation will be delayed. Access to courses and course scheduling also were cited as institutional factors impacting time to degree. Course scheduling was limited by faculty availability, physical facilities, and classroom size. Physical and staff limitations resulted in artificial enrollment limitations which impeded access to classes for students. The Iowa study also noted that curricular expansion due to the recent knowledge explosion in many disciplines has led students to take a lighter course credit load to be able to complete a more rigorous course content with better grades. The final institutional factor cited in this study as contributing to extended time to graduation was advising. Students noted that the lack of faculty emphasis on advising was a major factor in their inability to complete a degree in 4 years.

The Iowa study conducted by KPMG Peat Marwick (1989) concluded that

1. Extra-institutional factors are significantly responsible for extended degree completion timeframes. The fact that students are, on average, registering for insufficient credits supports the notion that there are changing cultural expectations with respect to degree completion timeframes. Evidence that more students are working verifies the notion that the changed economic environment of higher education has led to changed patterns in student employment and course taking behavior.
2. Institutional factors are marginally responsible for extended degree completion timeframes. In some cases curricula are tight and allow students little flexibility. Advising, access to courses, and communication to students about degree completion

requirements are areas which must be more intentionally addressed.

3. Personal factors are significantly responsible for extended degree completion timeframes. Students are not registering for sufficient numbers of courses, are dropping courses, and are working more. Rising education costs and reduced access to financial aid have a considerable impact on how students spend their time during their undergraduate years. (p. 29)

In the study of baccalaureate student graduation rates and time to degree at Illinois public universities, the Illinois State Board of Higher Education (1992) found that only 27% of first-time freshmen graduated within 4 years, the traditional time required to complete a baccalaureate degree. After 8 years, 51% of first-time freshmen earned a baccalaureate degree. Time-to-degree rates varied by racial/ethnic group and gender. After 4 years, 5% of Black first-time freshmen and 9.8% of Hispanic first-time freshmen earned baccalaureate degrees as compared to 30.4% for all other students. By the 8 year mark, 21.3% of Black first-time freshmen and 29.4% of Hispanic first-time freshmen earned a degree as compared to 56.3% of all other students. Within each racial/ethnic group a slightly higher percentage of women than men earned a degree.

As noted earlier, much of the early analysis on time-to-degree rates focused on student characteristics and behaviors while the influences of institutional policies and practices on graduation and time to degree were less fully studied. The Illinois State Board of Higher Education (1992) suggested the following student characteristics and behaviors and

institutional policies and practices that impact time to degree:

Student Characteristics and Behaviors

1. Academic Preparation and Institutional Selectivity
2. Financial Circumstances
3. Part-time or Interrupted Attendance
4. Course Completion
5. Changing Degree or Program Major
6. Taking a Double Major
7. Postgraduation Plans

Institutional Policies and Practices

1. Specification of Courses Within Majors
2. Advisement
3. Course Scheduling and Availability
4. Degree Requirements
5. Tuition Policies
6. Financial Aid Policies

To improve graduation and time-to-degree rates, higher education administrators must understand how the above factors interact to affect student academic progress. The report suggested that since most analyses of time-to-degree rates to date focused on changing student behavior, more emphasis must be focused on evaluating the institutional policies and practices and their impact on time-to-degree rates. Blanco (1994) indicated that methods to shorten time to degree were to control or reduce the number of credits required for the degree; increase the use of accelerated

mechanisms such as Advanced Placement, early admissions, dual enrollment, and College Level Examination Program; maximize summer school; foster the use of technology and distance learning; or compress semesters.

Garcia (1994), in an analysis of graduation and time to degree at California State University, had similar findings to the Illinois State Board of Higher Education (1992) although his study looked primarily at student characteristics and behaviors. Garcia determined that special admits, students who took 12 or fewer credits per semester, and students with undeclared majors at entry or who changed majors took longer to complete degree programs. He reported that the basic recipe for completing an undergraduate degree within the 4-year template was to maintain continuous enrollment and earn more than 30 semester units each academic year. Stopouts and students who completed just 12 units a semester were fated to at minimum a 6-year degree. Garcia (1994) also found that males, students under the age of 20 at entry, and ethnic/racial groups that were underrepresented on the campus took longer to earn degrees. An important question posed by this study was do observed shifts in graduation rates or time to degree represent intrinsic changes in student behavior or reflect changing student bodies and curriculum? Garcia (1994) suggested that higher graduation rates reflected some success with students who under previous regimes would have been

dropouts. Time-to-degree rates increased as graduation rates have improved.

Knight's (1994) findings were similar. In his time-to-degree analysis of a state-supported comprehensive university in the Southeast, he found that academic ability (SAT scores, high school GPA, freshman year GPA) had the strongest effect, along with cumulative credit hours earned and courses dropped, on time to degree. Age had a fairly substantial effect with older students taking longer to complete a bachelor's degree which contradicts the findings of Garcia (1994). Females obtained their degrees slightly faster than males. Enrollment behaviors such as graduating with considerably more than the minimum required credit hours or dropping several courses had strong effects on time to degree. Evidence suggested that students may earn substantially more than the minimum number of credits required for graduation because of enrollment in elective or required remedial courses, changing majors, or because desired courses were not available and students enrolled in additional courses to maintain full-time status. Knight (1994) noted that institutional actions such as admitting higher academic ability students, limiting course dropping behavior, and examining reasons for and possibly limiting total credit hours earned will decrease time to degree.

The University of North Carolina (1993) reported that students engaged in behaviors that reflect the state of the job market. Student efforts to improve their chances of

employment upon graduation extended time to degree. These behaviors included a concern for grades that led students to repeat courses; increased participation in internship, practica, and cooperative education experiences; the addition of a minor or second major to increase marketability; and the inclusion of study abroad. Institutional factors or practices contributing to lengthened time to degree as reported in the North Carolina study included difficulty in scheduling required courses; students taking unnecessary or inappropriate courses or courses out of sequence; and course withdrawal, course repeat, suspension, and reinstatement policies that facilitated student behaviors which lengthen time to degree.

As Blanco (1994) suggested, change must be attractive for institutions and students to become more invested in shortening time to degree. She outlined several institutional and student incentives to provide an impetus for shortening time to degree. Ideas for institutional incentives included offering financial awards for institutions that demonstrate an increase in the percentage of graduates finishing in less-than-normal time; returning fiscal savings from accountability initiatives to the institution to support their time-to-degree initiatives; limiting state-subsidized education; rewarding faculty directly for outstanding commitment to teaching; and awarding degrees for competency attainment. Incentives for students to graduate at a quicker rate were to create a graduation

award for completing a degree program in a shortened period of time, limit course credits to define adequate progress toward a degree, implement an excessive credit surcharge, increase full-time credit loads and consider block tuition, improve academic advising, provide tuition rebates for using selected technology or course time periods, and allow elective credit for service learning.

The University Restructuring Initiative, completed by the University of Florida Office of the President in the Spring of 1995, noted that undergraduate students found the process and management of the degree process confusing, complex, and inefficient. The report noted that students had difficulty with academic advising and often had difficulty getting the courses they needed to fulfill general education requirements and prerequisites for their major. Faculty worried that class sizes were growing too large for effective teaching and found it difficult to schedule the right classes at the right time because

faculty and departments often find themselves without adequate data or organizational structures to anticipate student demand or to acquire the resources to meet it in a timely and effective fashion. This mismatch of demand and supply produces delayed student graduation, excess credit hours taken toward degrees, under-used faculty and staff resources, and over-burdened support facilities. (p.6)

This report indicated that students graduating in the Spring 1994 took on average 23 credits more than required for the degree. Reasons cited for the excess credit hours were changing majors; taking minors not required for graduation; dropping, repeating, or failing courses; taking hours to

enhance skills or expand horizons; and maintaining full-time status while seeking entry into restricted courses.

Summary

The higher education environment in the 1990s differed significantly from the environment of previous decades. Changing student demographics coupled with increased concern over financing issues presented new challenges for postsecondary education. Outcome measurements assumed a new importance with the growing public demand for accountability. Traditional outcome measurements such as persistence and retention rates and economic and social returns continued to be of importance in assessing the effectiveness of colleges and universities. Time to degree emerged as a new indicator of institutional effectiveness given changing student characteristics and patterns of institutional resource allocation.

This review of literature indicates that both student characteristics and institutional variables are important in predicting time to degree. While most of the research focused on how student characteristics impacted retention, persistence, and time to degree, institutional variables deserve equal attention in analyzing these issues. As the literature revealed, some of the same variables which influenced enrollment behaviors are important in time-to-degree analyses. Institutional variables such as control, selectivity, and size also impact time to degree. In

addition, institutional policies and practices including advisement, course scheduling, expenditures on resources, and faculty/student ratios have implications for time to degree. Careful consideration must be given to what impact these institutional variables have on extending time to degree for undergraduate students.

CHAPTER III METHODOLOGY

Introduction

The length of time necessary for students to complete a bachelor's degree has become of increasing concern to legislatures and the public in light of financial constraints and accountability pressures. A large body of research is devoted to persistence and retention issues and educational attainment; however, as Knight (1994) noted, little if any published research has focused on time to degree. The research on persistence and retention issues and educational attainment has concentrated on both student and institutional characteristics in assessing enrollment behaviors. A more substantial body of this research is devoted to student characteristics while limited in-depth analysis has been done on institutional factors impacting persistence, retention, and educational attainment. The purpose of this study was to analyze the perceptions and attitudes of higher education administrators regarding institutional factors which extend time to degree attainment for undergraduate students at a major public research university in the Southeast. Discussed in this chapter is the methodology employed to address these issues. Included are the study's null hypotheses and

statistical applications, a statement of variables, and sampling and data collection procedures.

Statement of the Purpose

The purpose of this study was to analyze the perceptions and attitudes of higher education administrators regarding institutional factors which extend time-to-degree attainment for undergraduate students at a major public research university in the Southeast. In particular, this study assessed the perceptions and attitudes of department heads in undergraduate colleges supported by Educational and General funds.

This study answered the following questions:

1. What individual institutional variables and groups of variables extend time to degree for undergraduate students as perceived by department heads?

2. Is there a difference among colleges in the perceptions of department heads regarding individual institutional variables which extend time to degree for undergraduate students?

3. Is there a difference among colleges in the perceptions of department heads regarding grouped institutional variables which extend time to degree for undergraduate students?

Selection of the Sample

The sample for this study consisted of all department heads in the eight undergraduate colleges supported by Educational and General (E & G) funds at a major public research university in the Southeast. The college was selected as a unit of measure since it was assumed that differences in the variables tested could be attributed to membership in a given college. The colleges included were Architecture, Business Administration, Education, Engineering, Fine Arts, Health & Human Performance, Journalism & Communications, and Liberal Arts & Sciences.

Collection of the Data

Data assessing institutional variables extending time to degree for undergraduate students was collected by surveying department heads in the eight colleges supported by Educational and General funds. A total of 55 department chairs were included in the sample. Of these 55 surveys, 47 were returned. Six of the returned surveys contained missing data and were not included in the quantitative analysis.

Research Design

Research question #1 analyzed institutional factors extending time to degree for undergraduate students as perceived by department heads. This research question was

tested by using descriptive statistics to summarize survey results. Measures of central tendency, the mean, median, and mode were calculated for all 28 variables as well as for these same variables grouped by college. Central tendency statistics enabled the researcher to obtain an easily interpreted description of the typical performance of each group (Borg & Gall, 1989). Measures of variability, standard deviation, variance, range, and frequency distribution were then calculated for all 28 variables as well as for these same variables grouped by college. The standard deviation enabled the researcher to determine the extent to which scores in the distribution, on the average, deviated from the mean (Borg & Gall, 1989). By analyzing the frequency distribution and the range, the researcher was able to see the dispersion of scores and determine if there was a difference within colleges in the perception of department heads regarding institutional variables which extend time to degree for undergraduate students. These measures of central tendency and variability were also calculated for the four blocks of variables, resource allocation, faculty effort, curriculum and program issues, and logistic issues, both for the entire sample and then grouped by college.

The second research question compared and contrasted the perceptions of department heads among colleges regarding individual institutional variables which extend time to degree for undergraduate students and was tested by the following null hypothesis: H_0^1 : There is no significant

difference among the perceptions of department heads compared between colleges regarding individual institutional factors which extend undergraduate students' time to degree. The alpha level for the rejection of the null hypothesis was set at the .05 level. Multivariate analysis of variance was used to analyze this research question. This method of analysis was selected because it allowed the researcher to determine whether several groups, in this case department heads from the eight colleges, differed on more than one dependent variable. Borg and Gall (1989) noted, "Groups are likely to differ in some respect because of many interrelated differences in their personal background. MANOVA helps the researcher conceptualize and analyze the nature of multiple influences" (p. 560). This type of statistical analysis enabled the researcher to look at differences among department heads in the same college as well as differences between the department heads in all eight colleges on each of the 28 variables measured by the survey.

Each department head included in this MANOVA analysis had a score on 28 dependent variables. These scores were represented by a mathematical expression called a vector. A mean vector score, called a centroid, was calculated for department heads grouped by college. The purpose of MANOVA was to determine whether there were statistically significant differences between the centroids of the eight different groups (Borg & Gall, 1989).

In testing for the statistical significance of the difference between groups centroids, an F value is revealed. When a statistically significant MANOVA F was obtained, a posthoc analysis was conducted using the Tukey's HSD test on the dependent variable to determine where the statistically significant difference were which contributed to the overall MANOVA F. Posthoc comparisons are used to examine all possible differences between means. Tukey's HSD test is designed specifically for pairwise comparisons between means at a designated significance level and controls the maximum experimentwise error rate under any complete or partial null hypothesis.

The third research question compared and contrasted the perceptions of department heads among colleges regarding grouped institutional variables which extend time to degree for undergraduate students and was tested by the following null hypothesis: H_0^2 : There is no significant difference among the perceptions of department heads compared between colleges regarding grouped institutional factors which extend undergraduate students' time to degree. The alpha level for the rejection of the null hypothesis was set at the .05 level. To answer this question, the 28 individual variables were grouped into four clusters: resource allocation, faculty effort, curricular and program issues, and logistical issues. Each cluster of variables was analyzed through a separate MANOVA and posthoc analysis using Tukey's HSD test.

Statement of Variables

Variables associated with institutional factors which influence time to degree were analyzed using survey data. The institutional variables were divided into four categories: resource allocation, faculty effort, curricular/program issues, and logistical issues. For resource allocation and faculty effort variables, data provided by the 1993-1994 Florida Quality Evaluation Project were utilized for comparison purposes.

The following resource allocation variables were analyzed:

X1--Percentage of total resources invested in salaries and benefits for faculty.

X2--Percentage of total resources invested in salaries and benefits for A & P and USPS staff.

X3--Percentage of total resources invested in operating expenses. This includes but is not limited to supplies, travel allowances, computer hardware and software, contractual costs, and copying costs.

X4--Percentage of total resources by college devoted to operating capital outlay (OCO--equipment and furnishings).

X5--Faculty/student ratio.

X6--Number of nonacademic positions. This included all A & P and USPS positions.

X7--Number of teaching faculty employed.

X8--Class size for lower division courses.

X9--Class size for upper division courses.

Faculty effort was analyzed using the following variables:

X10--Number of faculty holding doctoral degrees.

X11--Percentage of faculty effort spent on instruction.

X12--Percentage of faculty effort spent on academic advising.

X13--Percentage of faculty effort spent on research.

X14--Number of lower division course sections taught by faculty holding rank each semester.

X15--Number of upper division course sections taught by faculty holding rank each semester.

X16--Number of lower division course sections taught by adjunct faculty, instructors, or teaching assistants each semester.

X17--Number of upper division course sections taught by adjunct faculty, instructors, or teaching assistants each semester.

The following were variables assessing curricular and program issues:

X18--Knowledge explosion--rapid growth in the body of knowledge associated with the discipline which increases the content and complexity of courses.

X19--Degree requirements--includes credit hours required to graduate, sequenced course obligations, core curriculum requirements, and experiential learning situations.

X20--Requirements placed on academic programs by professional associations which accredit the program.

X21--Admissions requirements for limited access programs.

The analysis of logistical issues extending time to graduation incorporated the following variables:

X22--Scheduling of classroom space--size and number of rooms available.

X23--Timing/sequencing of courses offered each semester.

X24--Number of course sections offered each semester for general education and Gordon Rule courses.

X25--Liberal nature of course drop and/or withdrawal policies.

X26--Absence of a grade forgiveness policy.

Selection of variables was based on previous research and logic. Institutional variables used in the survey were all resource allocation issues which can be controlled by the institution. Institutional variables that were the same for all students across colleges such as moneys spent on instructional resources, student services spending, support of the libraries, and Academic Affairs expenditures were not included in the survey and the descriptive analysis.

Development of the Survey

The purpose of the survey was to measure the perceptions of higher education administrators concerning institutional factors which extend time to graduation for undergraduate

students. The survey was developed after reviewing the literature regarding both educational attainment and time to degree. After institutional factors influencing educational attainment and time to degree were identified, these variables were grouped in four categories: resource allocation, faculty effort, curricular and program issues, and logistical issues.

A Likert scale survey was developed to assess the perceptions of department heads concerning how important each of the 26 variables identified above was in extending undergraduate students' time to graduation. The survey met the following criteria, deemed important by Fowler (1984):

1. The questionnaire was self-explanatory and did not involve reading instructions consistently.
2. The questionnaire was limited to closed questions to avoid problems with answers being incomplete, vague, and difficult to code and, therefore, of limited value as a measurement.
3. Only one question form was used throughout the survey. This minimized confusion on the part of the respondent and made the survey easy to answer.
4. Redundant information regarding what the questions were intended to measure was provided at the beginning of each section to decrease opportunity for the respondent to be confused.

Because the survey assessed perceptions and was subjective in nature, great care was given to increasing the

validity of the instrument by taking the following three steps (Fowler, 1984). First, survey questions were designed to be as reliable as possible. Survey questions were presented in a standardized format. The survey was reviewed by a research expert for content validity. This expert was asked to determine if the questions covered relevant content and were clearly and concisely stated. Revisions were made to some questions to remedy problems with wording and improve clarity so the questions would carry the same meaning for all respondents. This expert determined that the survey covered relevant content and that the format was well organized. Second, when creating the Likert scale, five categories were developed along the continuum. Fowler (1984) indicated that by creating more categories than fewer, the real variation among respondents could be measured. Finally, multiple questions were asked under each of the four topic areas to improve the validity of the measurement process.

The survey was then pilot tested on several department heads in the College of Education. Department heads were asked to complete the survey and comment about any areas of the survey and accompanying materials that needed clarification or improvement. In particular, pretest participants were asked if the questions on the survey were clear and understandable, whether the instructions for completing the survey and providing data were free from ambiguities, and how long it took to complete the instrument. Their suggestions were incorporated in the final revisions of

the survey instrument. After the survey was finalized, the internal consistency measurement for the instrument was calculated. Coefficient alpha, or Cronbach's alpha, was used as the survey response options were not dichotomous but in a Likert scale format. The following formula was used:

$$\alpha = \left(1 - \frac{\sum_{\text{items}} S^2_{\text{item}}}{S^2_{\text{instrument}}} \right) \left(\frac{k}{k-1} \right)$$

Coefficient alpha values range from 0 to 1; the value achieved for this survey was .84454.

Limitations to the Study

The limits of applicability of this investigation are, most strictly, confined to a major Southeast public research university. This study was limited in its analysis to undergraduate colleges supported by Education and General (E & G) funds.

Results of this study are limited in their generalizability to the selected university because institutional characteristics; resource allocation practices; and curricular, program, and logistical issues are institution specific. The literature (Blanco, 1994; Stoecker, Pascarella, & Wolfle, 1988; Velez, 1985) indicated that campus environment, policies, and practices have significant impact on persistence and completion rates. The very characteristics that make higher education institutions

unique such as size, location, composition of the student body, mission and type of control make the assessment of factors extending time to degree institution specific. Modifications can be made to incorporate data from other institutions in order to expand the generalizability of the findings. This study provides a broad framework for higher education institutions to conduct a time-to-degree analysis using institutional variables.

CHAPTER IV ANALYSIS OF DATA AND FINDINGS

Introduction

The purpose of this study was to analyze the perceptions and attitudes of higher education administrators regarding institutional factors which extend time to degree attainment for undergraduate students at a major public research university in the Southeast. In particular, this study assessed the perceptions and attitudes of department heads in eight undergraduate colleges supported by Education and General funds. A report of the analysis of data collected concerning these institutional factors which extend undergraduate students' time to graduation follows.

Data Collection

Data assessing department heads' perceptions of institutional factors extending students' time to graduation was collected through a survey instrument. The survey divided institutional variables extending time to graduation into four areas: resource allocation, faculty effort, curricular and program issues, and logistical issues.

Responses were calculated using a 5-point scale. The choices ranged from no contribution to strong contribution.

Numerical weightings were assigned to the options with the highest number reflecting that the variable had a strong contribution to extending undergraduate students' time to graduation.

Description of the Respondents

The survey instrument was mailed to all department heads in the eight undergraduate colleges supported by Education and General funds. Of the 55 surveys mailed, 47 were returned. The percentage of surveys returned is described and categorized in Table 1.

Table 1

Responses to the Survey by College

College	Percentage of Return
Liberal Arts & Sciences	86
Architecture	100
Journalism & Communications	75
Engineering	100
Business	66
Education	50
Fine Arts	66
Health & Human Performance	100
Total Returned	85

Analysis of Survey Responses

The first research question posed by this study analyzed individual institutional variables and grouped institutional variables which extend undergraduate students' time to graduation as perceived by department heads. Twenty-eight individual variables were included in the survey. These variables were grouped into four areas: resource allocation, faculty effort, curricular and program issues, and logistical issues. Variables 1 through 11 referred to resource allocation. Variables 12 through 19 referred to faculty effort. Variables 20 through 23 referred to curricular and program issues. Variables 24 through 28 referred to logistical issues.

Analysis of Individual Variable Responses for All Colleges

Table 2 reports a summary of the overall mean scores, number of respondents (n), and standard deviation for each of the 28 individual institutional variables. Four variables had mean scores above 3.5. Variable 7 had the strongest agreement. The mean score was 4.0. This variable referred to the number of teaching faculty employed in the department. 75.6% of the respondents rated this variable 4 or 5 indicating that the number of teaching faculty employed by the department strongly contributes to extending time to graduation for undergraduate students. In the same area, resource allocation, variable 5, faculty/student ratio, had a

Table 2

Analysis of Variable (28) Responses

Variable Number	N	Overall Mean	Standard Deviation
1	40	2.95	1.32
2	40	2.25	1.19
3	41	2.85	1.11
4	41	2.80	1.42
5	41	3.51	1.40
6	41	2.51	1.29
7	41	4.00	1.36
8	40	3.18	1.26
9	41	2.90	1.39
10	40	2.00	0.85
11	41	1.22	0.42
12	40	2.05	1.34
13	41	3.02	1.31
14	41	2.90	1.43
15	41	2.20	1.27
16	41	2.56	1.50
17	41	2.71	1.54
18	41	2.32	1.54
19	41	2.29	1.62
20	41	3.20	1.47
21	41	3.37	1.39
22	41	3.00	1.58
23	40	2.43	1.43
24	41	3.61	1.48
25	41	3.27	1.18
26	40	3.33	1.33
27	41	3.54	1.45
28	39	2.18	1.19

mean score of 3.51 with 63.4% of the respondents scoring this variable a 4 or 5. Two variables in the area of logistical issues emerged as making an above average contribution to extending undergraduate students time to graduation, variables 24 and 27. Variable 24 referred to the scheduling of classroom space. This variable had a mean score of 3.61 with 65.9% of department heads giving it a score of 4 or 5. Variable 27 referred to the liberal nature of course drop and withdrawal policies. This variable received a mean score of 3.54 with 56.1% of department heads rating it 4 or 5.

Six items received a score of 2.40 or below indicating that respondents felt these variables made slight to no contribution to extending undergraduate students time to graduation. Variable 12, the number of faculty holding doctoral degrees, demonstrated the least contribution to extending time to graduation for undergraduate students. Fifty-five percent of survey respondents indicated that this variable made no contribution to extending undergraduate students' time to graduation. Three additional variables in the area of faculty effort, variables 15, 18, and 19, also received mean scores below 2.40. Variables 18 and 19 referred to lower and upper division course sections taught by adjunct faculty, instructors, or teaching assistants each semester. Of the department heads, 65.9% felt this made slight to no contribution for lower division courses and 68.3% felt this made slight to no contribution for upper division courses. In the area of logistical issues, variable 28, absence of a

grade forgiveness policy, received a mean score of 2.18. Variable 2, the percentage of resources invested in salaries and benefits for Administrative and Professional and USPS staff, had a mean score of 2.25.

Variables 10 and 11 referenced class size for lower and upper division courses, respectively. Of the department heads, 75% felt that the optimum class size for lower division course was 1-60 students, and 78% felt that the optimum class size for upper division courses was 1-30. All agreed upper division courses should have no more than 60 students.

Analysis of Individual Variable Responses by College

Within each of the eight colleges, differences emerged in terms of which institutional variables department heads perceived to be most and least important in extending undergraduate students' time to graduation. Table 3 reports the mean scores on each of the 28 individual institutional variables by college. Department heads in the College of Liberal Arts & Sciences perceived variables 7, number of teaching faculty employed, and 24, scheduling of classroom space, to be most important with mean scores of 4.33 and 4.27, respectively. Variables 19, number of upper division courses taught by adjunct faculty, instructors, or teaching assistants, and 28, absence of a grade forgiveness policy, were reported as having slight to no importance with mean scores of 1.67 and 1.71, respectively.

Table 3

Mean Score on Individual Variables by College

Variable	A & S	Arch.	J & C	Eng.	Bus.	Ed.	F Art	HPH
1	3.14 (14)	2.80 (5)	1.67 (3)	3.50 (10)	1.00 (2)	5.00 (1)	3.50 (2)	2.00 (3)
2	2.00 (14)	3.40 (5)	1.67 (3)	2.20 (10)	2.00 (2)	1.00 (1)	3.50 (2)	2.00 (3)
3	2.60 (15)	4.00 (5)	3.67 (3)	2.60 (10)	1.50 (2)	2.00 (1)	5.00 (2)	2.00 (3)
4	2.20 (15)	3.60 (5)	4.67 (3)	2.90 (10)	2.00 (2)	1.00 (1)	5.00 (2)	2.00 (3)
5	3.93 (15)	3.20 (5)	3.33 (3)	3.60 (10)	1.00 (2)	5.00 (1)	3.00 (2)	3.33 (3)
6	2.20 (15)	3.40 (5)	2.67 (3)	2.20 (10)	2.00 (2)	2.00 (1)	4.50 (2)	2.67 (3)
7	4.33 (15)	4.00 (5)	5.00 (3)	3.70 (10)	1.50 (2)	5.00 (1)	4.00 (2)	3.67 (3)
8	3.27 (15)	3.20 (5)	5.00 (2)	3.30 (10)	1.50 (2)	1.00 (1)	3.00 (2)	3.00 (3)
9	2.73 (15)	4.00 (3)	4.00 (3)	3.20 (10)	1.50 (2)	1.00 (1)	2.50 (2)	3.00 (3)
10	2.27 (15)	1.60 (5)	2.33 (3)	1.90 (10)	2.00 (2)	2.00 (1)	1.00 (2)	2.00 (2)
11	1.13 (15)	1.00 (5)	1.00 (3)	1.30 (10)	1.50 (2)	1.00 (1)	1.00 (2)	2.00 (3)
12	2.20 (15)	2.00 (5)	3.00 (3)	1.80 (10)	1.00 (2)	1.00 (1)	1.00 (1)	2.67 (3)
13	2.67 (15)	4.00 (5)	3.33 (3)	3.30 (10)	1.00 (2)	2.00 (1)	3.00 (2)	3.67 (3)
14	2.13 (15)	4.20 (5)	4.00 (3)	3.60 (10)	1.50 (2)	1.00 (1)	3.00 (2)	2.67 (3)
15	2.07 (15)	2.80 (5)	4.67 (3)	2.10 (10)	1.00 (2)	1.00 (1)	1.50 (2)	1.34 (3)
16	2.60 (15)	3.40 (5)	1.00 (3)	2.60 (10)	1.00 (2)	1.00 (1)	4.00 (2)	3.00 (3)
17	2.73 (15)	3.80 (5)	3.33 (3)	2.20 (10)	1.00 (2)	2.00 (1)	3.00 (2)	3.00 (3)
18	2.13 (15)	3.00 (5)	2.33 (3)	2.00 (10)	1.00 (2)	1.00 (1)	5.00 (2)	2.67 (3)
19	1.67 (15)	3.60 (5)	3.00 (3)	2.10 (10)	1.00 (2)	1.00 (1)	5.00 (2)	2.67 (3)
20	2.60 (15)	4.20 (5)	3.00 (3)	2.20 (10)	1.50 (2)	2.00 (1)	5.00 (2)	2.67 (3)
21	2.73 (15)	4.80 (5)	4.67 (3)	3.60 (10)	2.50 (2)	2.00 (1)	4.00 (2)	2.67 (3)
22	1.87 (15)	4.80 (5)	4.00 (3)	3.30 (10)	2.50 (2)	5.00 (1)	3.50 (2)	3.00 (3)
23	2.00 (14)	4.20 (5)	3.33 (3)	2.50 (10)	1.50 (2)	1.00 (1)	2.50 (2)	1.33 (3)
24	4.27 (15)	3.80 (5)	4.00 (3)	3.00 (10)	1.50 (2)	1.00 (1)	4.50 (2)	3.33 (3)
25	2.93 (15)	3.80 (5)	3.67 (3)	3.60 (10)	1.50 (2)	4.00 (1)	4.00 (2)	3.00 (3)
26	3.27 (15)	3.40 (5)	5.00 (2)	4.30 (10)	1.00 (2)	3.00 (1)	2.00 (2)	1.67 (3)
27	3.27 (15)	3.40 (5)	3.67 (3)	4.00 (10)	3.00 (2)	4.00 (1)	3.00 (2)	4.00 (3)
28	1.71 (14)	2.40 (5)	2.67 (3)	2.60 (10)	3.00 (2)	missing	2.50 (2)	1.33 (3)

In the College of Architecture, variables 21 and 22, degree requirements and requirements placed on academic programs by professional accrediting associations, had mean scores of 4.80 indicating that these variables made a strong contribution to extending undergraduate students' time to graduation. Variable 12, number of faculty holding doctoral degrees, had a mean score of 2.00 indicating that this variable made a slight contribution to extending undergraduate students' time to degree completion.

Department chairs in the College of Journalism & Communications rated three variables a 5: 7--number of teaching faculty employed, 8--class size for lower division courses, and 26--number of course sections offered each semester for general education and Gordon Rule courses. These department heads all rated variable 16, number of lower division course sections taught by faculty holding rank each semester, as a 1.

For the College of Engineering, variables 20 (mean score = 4.20), the knowledge explosion, and 26 (mean score = 4.30), number of course sections offered each semester for general education and Gordon Rule courses, made the strongest contribution to extended undergraduate degree completion. Variables 12 (mean score = 1.80), number of faculty holding doctoral degrees, and 18 (mean score = 2.00), number of lower division course sections taught by adjunct faculty, instructors, or teaching assistants, had mean scores in the slight contribution range.

Mean scores for all of the 28 variables were 3.00 or below in the College of Business. This suggests that department heads in this college do not consider institutional factors as making a contribution to extended time to graduation for undergraduate students. Four variables were rated a 5 in the College of Education: 1--percentage of resources invested in salaries and benefits for faculty, 5--faculty/student ratio, 7--number of teaching faculty employed, and 22--requirements placed on academic programs by professional accrediting agencies. Four variables also received a rating of 5 in the College of Fine Arts: 3--percentage of resources invested in operating expenses, 4--percentage of resources devoted to operating capital outlay, and 18 and 19--number of lower and upper division course sections taught by adjunct faculty, instructors, or teaching assistants each semester. The two variables seen as making slight to no contribution on extended undergraduate degree completion for the College of Fine Arts were variable 12 (mean score = 1.00), number of faculty holding doctoral degrees, and variable 15 (mean score = 1.50), percentage of faculty effort spent on research.

The two variables considered as having the strongest contribution on extending undergraduate student's time to graduation in the College of Health & Human Performance were variable 13 (mean score = 3.67), percentage of faculty effort spent on instruction, and variable 27 (mean score = 4.00), liberal nature of course drop and withdrawal policies.

Variables considered as making slight to no contribution for the college were variable 15 (mean score = 1.34), percentage of faculty effort spent on research, variable 23 (mean score = 1.33), admissions requirements for limited access programs, and variable 28 (mean score = 1.33), absence of a grade forgiveness policy. It is interesting to note that in this college one department chair rated all 28 variables, with the exception of variable 27 (rating = 4) as a 1.

Analysis of Grouped Variable Responses

Mean scores for each block of variables, resource allocation, faculty effort, curricular and program issues, and logistical issues, were calculated as a way to compare variations in department heads' responses to each of the four areas of institutional factors extending undergraduate students' time to graduation. Table 4 reports the summary of the overall mean scores of respondents for each of the four areas and the mean scores in each of the four areas by college. It is important to note the difference in mean scores between the Colleges of Architecture and Business in the area of faculty effort. Department chairs in Architecture (mean score = 3.35) regarded faculty effort as an above-average contributor to extended undergraduate degree completion. Department chairs in Business (mean score = 1.06) viewed this variable as making no contribution. It is also important to note the differences between the College of Architecture and the Colleges of Liberal Arts & Sciences and

Table 4

Means by Variable Blocks by College

Variable Block	All Colleges	A & S	Arch.	J & C	Eng.	Bus.	Ed.	F Art	HHP
Resource Allocate	2.72	2.68	3.04	3.03	2.76	1.59	2.36	3.27	2.45
Faculty Effort	2.50	2.275	3.35	3.08	2.46	1.06	1.25	3.125	2.5
Curric. & Prog.	2.98	2.27	4.50	3.75	3.40	2.00	2.50	3.25	2.50
Logistic Issues	3.15	3.07	3.36	3.47	3.50	2.00	2.40	3.20	2.67

Business in the area of curricular and program issues. Department chairs in Architecture (mean score = 3.35) rated curricular and program issues as more important in extending undergraduate students' degree programs than their colleagues in Liberal Arts & Sciences (mean score = 2.27) and Business (mean score = 2.0). One can also observe that for five of the eight colleges logistical issues had a mean score of 3.00 or above (see Table 4).

Results of Hypotheses Testing

The following null hypotheses were tested in this study:

1. There is no significant difference among the perceptions of department heads compared between colleges regarding individual institutional variables which extend undergraduate students' time to graduation.

2. There is no significant difference among the perceptions of department heads compared between colleges regarding grouped institutional variables which extend undergraduate students' time to graduation.

Multivariate analyses of variance were conducted using the eight colleges as the independent variables. The dependent variables were (a) the 28 institutional factors and (b) these variables grouped into four blocks: resource allocation, faculty effort, curricular and program issues, and logistical issues. A criterion of .05 was used to determine the level of significance. When a significant relationship was determined within a comparison group,

Tukey's Studentized Range (HSD) test for variables was used to compare all possible pairs of group means and to control the type I experimentwise error rate. College codes used in the posthoc analyses are 1=Liberal Arts & Sciences, 2=Architecture, 3=Journalism & Communications, 4=Engineering, 5=Business, 6=Education, 7=Fine Arts, and 8=Health & Human Performance.

Analysis of Variance for 28 Individual Variables

Table 5 reports the analysis of variance results for each of the 28 individual variables. As seen in this table, the following variables are significant at the .05 level:

Variable 1: Percentage of resources invested in salaries and benefits for faculty

Variable 3: Percentage of resources invested in operating expenses

Variable 4: Percentage of resources devoted to operating capital outlay

Variable 11: Optimum class size for upper division courses

Variable 14: Percentage of faculty effort spent on academic advising

Variable 15: Percentage of faculty effort spent on research

Variable 19: Number of upper division course sections taught by adjunct faculty, instructors, or teaching assistants each semester

Variable 21: Degree requirements--includes credit hours required to graduate, sequenced course obligations, core curriculum requirements, and experiential learning situations

Table 5

Analysis of Variance for the 28 Individual Variables

Variable	Number of Observations (N)	Model Degrees of Freedom	F Value	Pr > F
1	40	7	2.45	.0391
2	40	7	1.47	.2117
3	41	7	5.28	.0004
4	41	7	3.68	.0048
5	41	7	1.49	.2055
6	41	7	1.41	.2364
7	41	7	1.68	.1495
8	40	7	1.80	.1219
9	41	7	0.97	.4670
10	40	7	0.83	.5707
11	41	7	2.93	.0169
12	40	7	0.70	.6751
13	41	7	1.69	.1455
14	41	7	3.28	.0092
15	41	7	3.62	.0053
16	41	7	1.61	.1683
17	41	7	1.00	.4511
18	41	7	1.58	.1761
19	41	7	2.52	.0343
20	41	7	2.25	.0547
21	41	7	2.60	.0298
22	41	7	3.76	.0042
23	40	7	2.49	.0367
24	41	7	2.25	.0548
25	41	7	1.39	.2432
26	40	7	5.60	.0003
27	41	7	0.32	.9382
28	39	7	1.14	.3631

Variable 22: Requirements placed on academic programs by professional association which accredit the program and/or certificate and licensure requirements

Variable 23: Admissions requirements for limited access programs

Variable 26: Number of course sections offered each semester for general education and Gordon Rule courses

Table 6 reports the analysis of variance results for variable 1. The F value of 2.45 and the $Pr > F$ value of .0391 was significant at the .05 level. Table 7 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 1 by college. The posthoc test revealed that while variable 1 was significant overall, there were no significant comparisons between pairs. The overall mean score for this variable (2.95) suggests that department heads, on average, believe faculty salary and benefits to moderately contribute to extending undergraduate degree completion.

Table 8 reports the analysis of variance results for variable 3. The F value of 5.28 and the $Pr > F$ value of .0004 was significant at the .05 level. Table 9 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 3 by college. The significant comparisons for variable 3 by college were Fine Arts and Liberal Arts &

Table 6

Analysis of Variance for Percentage of Resources Invested in Salaries and Benefits for Faculty (Variable 1)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	23.72	3.39	2.45	0.0391
Error	32	44.18	1.38		
Corrected Total	39	67.90			

R-Square	C.V.	Root MSE	FACTOR1 Mean
0.345	39.83	1.18	2.950

Sciences, Fine Arts and Engineering, Fine Arts and Business, Fine Arts and Health & Human Performance, Architecture and Liberal Arts & Sciences, Architecture and Business, and Architecture and Health & Human Performance. The difference in means between Fine Arts and Liberal Arts & Sciences was 2.4. The difference in means between Fine Arts and Engineering was 2.4. The difference in means between Fine Arts and Business was 3.6. The difference in means between Fine Arts and Health & Human Performance was 3.0. The difference in means between Architecture and Liberal Arts & Sciences was 1.4. The difference in means between Architecture and Business was 2.5. The difference in means between Architecture and Health & Human Performance was 2.0.

Table 7

Tukey's Studentized Range (HSD) Test for Percentage of
Resources Invested in Salaries and Benefits for Faculty
(Variable 1) by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
6-7	-3.16	1.50	6.16
6-4	-2.49	1.50	5.49
6-1	-2.08	1.86	5.80
6-2	-1.97	2.20	6.37
6-8	-1.40	3.00	7.40
6-3	-1.06	3.33	7.73
6-5	-0.66	4.00	8.66
7-4	-2.95	0.00	2.95
7-1	-2.52	0.36	3.23
7-2	-2.49	0.70	3.89
7-8	-1.98	1.50	4.98
7-3	-1.64	1.83	5.31
7-5	-1.31	2.50	6.31
4-1	-1.22	0.36	1.93
4-2	-1.39	0.70	2.79
4-8	-1.01	1.50	4.01
4-3	-0.67	1.83	4.34
4-5	-0.45	2.50	5.45
1-2	-1.64	0.34	2.33
1-8	-1.28	1.14	3.56
1-3	-0.95	1.48	3.90
1-5	-0.73	2.14	5.02
2-8	-1.98	0.80	3.58
2-3	-1.65	1.13	3.91
2-5	-1.39	1.80	4.99
8-3	-2.77	0.33	3.44
8-5	-2.48	1.00	4.48
3-5	-2.81	0.67	4.14

Alpha=0.05. Confidence=0.95. df=32. MSE=1.381. Critical Value of Studentized Range=4.581

Comparisons significant at the 0.05 level are indicated by ***.

Table 8

Analysis of Variance for Percentage of Resources Invested in Operating Expenses (Variable 3)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	25.96	3.71	5.28	0.0004
Error	33	23.17	0.70		
Corrected Total	40	49.12			

R-Square	C.V.	Root MSE	FACTOR3 Mean
0.528	29.36	0.838	2.853

Table 10 reports the mean score and the number of respondents for variable 3 by college. Department heads in the College of Fine Arts considered the percentage of resources invested in operating expenses, supplies, travel allocations, and computer equipment, as a strong contributor to extended time to graduation for undergraduate students while department heads in Liberal Arts & Sciences, Engineering, Business, and Health & Human Performance perceived this variable to make only a slight contribution. Department chairs in Architecture also viewed variable 3 as important in extending undergraduate degree programs particularly when compared to their colleagues in Liberal Arts & Sciences, Business, and Health & Human Performance.

Table 9

Tukey's Studentized Range (HSD) Test for Percentage of
Resources Invested in Operating Expenses (Variable 3) by
College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
7-2	-1.27	1.00	3.27
7-3	-1.14	1.33	3.81
7-4	0.30	2.40	4.50***
7-1	0.36	2.40	4.44***
7-6	-0.32	3.00	6.32
7-8	0.53	3.00	5.47***
7-5	0.79	3.50	6.21***
2-3	-1.65	0.33	2.31
2-4	-0.08	1.40	2.88
2-1	0.00	1.40	2.80***
2-6	-0.97	2.00	4.97
2-8	0.02	2.00	3.98***
2-5	0.23	2.50	4.77***
3-4	-0.72	1.07	2.85
3-1	-0.65	1.07	2.78
3-6	-1.46	1.67	4.79
3-8	-0.55	1.67	3.88
3-5	-0.31	2.17	4.64
4-1	-1.11	0.00	1.11
4-6	-2.24	0.60	3.44
4-8	-1.18	0.60	2.38
4-5	-1.00	1.10	3.20
1-6	-2.20	0.60	3.40
1-8	-1.11	0.60	2.31
1-5	-0.94	1.10	3.14
6-8	-3.13	0.00	3.13
6-5	-2.82	0.50	3.82
8-5	-1.97	0.50	2.97

Alpha=0.05. Confidence=0.95. df=33. MSE=0.702. Critical Value of Studentized Range=4.572.

Comparisons significant at the 0.05 level are indicated by ***.

Table 10

Mean Score for Percentage of Resources Invested in Operating Expenses (Variable 3) by College

Var.	A & S (N)	Arch. (N)	J & C (N)	Eng. (N)	Bus. (N)	Ed. (N)	F Art (N)	HHP (N)
3	2.60 (15)	4.00 (5)	3.67 (3)	2.60 (10)	1.50 (2)	2.00 (1)	5.00 (2)	2.00 (3)

The Fine Arts mean of 5.00, the Architecture mean of 4.00, and the Journalism & Communications mean of 3.67 are relatively close, and all point to the importance of variable 3.

Table 11 reports the analysis of variance results for variable 4. The F value of 3.68 and the $Pr > F$ value of .0048 was significant at the .05 level. Table 12 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 4 by college. The significant comparison for variable 4 by college was Journalism & Communications and Liberal Arts & Sciences. The difference in means between Journalism & Communications and Liberal Arts & Sciences was 2.47. For the College of Journalism & Communications, the mean score on variable 4 was 4.67. The mean score for the College of Liberal Arts & Sciences was 2.20. Department chairs in Journalism & Communications regarded the percentage of resources devoted to operating capital outlay to make a

Table 11

Analysis of Variance for Percentage of Resources Devoted to Operating Capital Outlay (Variable 4)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	35.27	5.04	3.68	0.0048
Error	33	45.17	1.37		
Corrected Total	40	80.43			

R-Square	C.V.	Root MSE	FACTOR4 Mean
0.438	41.71	1.170	2.805

strong contribution to extended undergraduate time to graduation while their counterparts in Liberal Arts & Sciences viewed this variable as only slightly important. This may suggest that more equipment is used in instruction by faculty in the College of Journalism & Communications.

Table 13 reports the analysis of variance results for variable 11. The F value of 2.93 and the Pr > F value of .0169 was significant at the .05 level. Table 14 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 11 by college. The significant comparisons for variable 11 by college were Health & Human Performance and

Table 12

Tukey's Studentized Range (HSD) Test for Percentage of Resources Devoted to Operating Capital (Variable 4) by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
7-3	-3.12	0.33	3.79
7-2	-1.76	1.40	4.56
7-4	-0.83	2.10	5.03
7-1	-0.05	2.80	5.65
7-8	-0.45	3.00	6.45
7-5	-0.78	3.00	6.78
7-6	-0.63	4.00	8.63
3-2	-1.70	1.07	3.83
3-4	-0.72	1.77	4.26
3-1	0.08	2.47	4.86***
3-8	-0.42	2.67	5.76
3-5	-0.79	2.67	6.12
3-6	-0.70	3.67	8.03
2-4	-1.37	0.70	2.77
2-1	-0.55	1.40	3.35
2-8	-1.16	1.60	4.36
2-5	-1.56	1.60	4.76
2-6	-1.54	2.60	6.74
4-1	-0.84	0.70	2.24
4-8	-1.60	0.90	3.40
4-5	-2.03	0.90	3.83
4-6	-2.07	1.90	5.87
1-8	-2.19	0.20	2.59
1-5	-2.65	0.20	3.05
1-6	-2.70	1.20	5.11
8-5	-3.45	0.00	3.45
8-6	-3.37	1.00	5.37
5-6	-3.63	1.00	5.63

Alpha=0.05. Confidence=0.95. df=33. MSE=1.369. Critical Value of Studentized Range=4.572.

Comparisons significant at the 0.05 level are indicated by ***.

Table 13

Analysis of Variance for Optimum Class Size for Upper Division Courses (Variable 11)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	2.69	0.38	2.93	0.0169
Error	33	4.33	0.13		
Corrected Total	40	7.02			

R-Square	C.V.	Root MSE	FACTOR11 Mean
0.383	29.71	0.362	1.220

Liberal Arts & Sciences, Health & Human Performance and Architecture, and Health & Human Performance and Journalism & Communications. The difference in means between Health & Human Performance and Liberal Arts & Sciences was .87. The difference in means between Health & Human Performance and Architecture was 1.00. The difference in means between Health & Human Performance and Journalism & Communications was 1.00. Table 15 shows the mean scores for these four colleges on variable 11. These mean scores reveal that department heads in the College of Health & Human Performance believe upper division course sections can be as large as 31-60 students while chairs in Liberal Arts & Sciences, Architecture, and Journalism & Communications view 1-30

Table 14

Tukey's Studentized Range (HSD) Test for Optimum Class Size
for Upper Division Courses (Variable 11) by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
8-5	-0.57	0.50	1.57
8-4	-0.07	0.70	1.47
8-1	0.13	0.87	1.61***
8-3	0.04	1.00	1.96***
8-2	0.14	1.00	1.86***
8-7	-0.07	1.00	2.07
8-6	-0.35	1.00	2.35
5-4	-0.71	0.20	1.11
5-1	-0.52	0.37	1.25
5-3	-0.57	0.50	1.57
5-2	-0.48	0.50	1.48
5-7	-0.67	0.50	1.67
5-6	-0.94	0.50	1.94
4-1	-0.31	0.17	0.65
4-3	-0.47	0.30	1.07
4-2	-0.34	0.30	0.94
4-7	-0.61	0.30	1.21
4-6	-0.93	0.30	1.53
1-3	-0.61	0.13	0.87
1-2	-0.47	0.13	0.74
1-7	-0.75	0.13	1.02
1-6	-1.08	0.13	1.34
3-2	-0.86	0.00	0.86
3-7	-1.07	0.00	1.07
3-6	-1.35	0.00	1.35
2-7	-0.98	0.00	0.98
2-6	-1.28	0.00	1.28
7-6	-1.44	0.00	1.44

Alpha=0.05. Confidence=0.95. df=33. MSE=0.131. Critical Value of Studentized Range=4.572.

Comparisons significant at the 0.05 level are indicated by ***.

Table 15

Mean Score for Optimum Class Size for Upper Division Courses (Variable 11) for the Colleges of Health & Human Performance, Liberal Arts & Sciences, Architecture, and Journalism & Communications

Variable	HHP (N)	A & S (N)	Arch. (N)	J & C (N)
11	2.00 (3)	1.13 (15)	1.00 (5)	1.00 (3)

students as the optimum class size for upper division courses.

Table 16 reports the analysis of variance results for variable 14. The F value of 3.28 and the $Pr > F$ value of .0092 was significant at the .05 level. Table 17 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 14 by college. The significant comparison for variable 14 was Liberal Arts & Sciences and Architecture. The difference between means was 2.07. The mean score for Liberal Arts & Sciences was 2.13 and the mean score for Architecture was 4.20. The percentage of faculty effort spent on academic advising is perceived as more of a contributing factor in extending undergraduate students' time to graduation by department chairs in the College of Architecture than by department chairs in Liberal Arts & Sciences. Department heads in Liberal Arts & Sciences view

Table 16

Analysis of Variance for Percentage of Faculty Effort Spent on Academic Advising (Variable 14)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	33.51	4.79	3.28	0.0092
Error	33	48.10	1.46		
Corrected Total	40	81.61			
R-Square	C.V.	Root MSE	FACTOR14 Mean		
0.411	41.597	1.21	2.902		

this variable as making a slight contribution while those in Architecture view it as an above average contributor.

Table 18 reports the analysis of variance results for variable 15. The F value of 3.62 and the Pr > F value of .0053 was significant at the .05 level. Table 19 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 15 by college. The significant comparisons for variable 15 by college were Journalism & Communications and Liberal Arts & Sciences, Journalism & Communications and Engineering, Journalism & Communications and Business, Journalism & Communications and Fine Arts, and Journalism &

Table 17

Tukey's Studentized Range (HSD) Test for Percentage of Faculty Effort Spent on Academic Advising (Variable 14) by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
2-3	-2.65	0.20	3.05
2-4	-1.54	0.60	2.74
2-7	-2.07	1.20	4.47
2-8	-1.32	1.53	4.38
2-1	0.05	2.07	4.08***
2-5	-0.57	2.70	5.97
2-6	-1.08	3.20	7.48
3-4	-2.17	0.40	2.97
3-7	-2.56	1.00	4.56
3-8	-1.85	1.33	4.52
3-1	-0.60	1.87	4.34
3-5	-1.06	2.50	6.06
3-6	-1.51	3.00	7.51
4-7	-2.42	0.60	3.62
4-8	-1.64	0.93	3.50
4-1	-0.13	1.47	3.06
4-5	-0.92	2.10	5.12
4-6	-1.49	2.60	6.69
7-8	-3.23	0.33	3.90
7-1	-2.17	0.87	3.81
7-5	-2.40	1.50	5.40
7-6	-2.78	2.00	6.78
8-1	-1.94	0.53	3.00
8-5	-2.40	1.17	4.73
8-6	-2.84	1.67	6.17
1-5	-2.31	0.63	3.57
1-6	-2.90	1.13	5.16
5-6	-4.28	0.50	5.28

Alpha=0.05. Confidence=0.95. df=33. MSE=1.458. Critical Value of Studentized Range=4.572.

Comparisons significant at the 0.05 level are indicated by ***.

Table 18

Analysis of Variance for Percentage of Faculty Effort Spent on Research (Variable 15)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	27.97	4.00	3.62	0.0053
Error	33	36.47	1.11		
Corrected Total	40	64.44			

R-Square	C.V.	Root MSE	FACTOR15 Mean
0.434	47.889	1.051	2.195

Communications and Health & Human Performance. The difference in means between Journalism & Communications and Liberal Arts & Sciences was 2.60. The difference in means between Journalism & Communications and Engineering was 2.57. The difference in means between Journalism & Communications and Business was 3.67. The difference in means between Journalism & Communications and Fine Arts was 3.17. The difference in means between Journalism & Communications and Health & Human Performance was 3.33. Table 20 reports the mean score and the number of respondents for variable 15 by college. Department chairs in the College of Journalism & Communications rated the percentage of faculty effort spent on research as making a strong contribution to extending the time undergraduate students' in

Table 19

Tukey's Studentized Range (HSD) Test for Percentage of
Faculty Effort Spent on Research (Variable 15) by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3-2	-0.62	1.87	4.35
3-4	0.33	2.57	4.80***
3-1	0.45	2.60	4.75***
3-7	0.06	3.17	6.27***
3-8	0.56	3.33	6.11***
3-5	0.56	3.67	6.77***
3-6	-0.26	3.67	7.59
2-4	-1.16	0.70	2.56
2-1	-1.02	0.73	2.49
2-7	-1.54	1.30	4.14
2-8	-1.02	1.47	3.95
2-5	-1.04	1.80	4.64
2-6	-1.92	1.80	5.52
4-1	-1.35	0.03	1.42
4-7	-2.03	0.60	3.23
4-8	-1.47	0.77	3.00
4-5	-1.53	1.10	3.73
4-6	-2.46	1.10	4.66
1-7	-1.99	0.57	3.13
1-8	-1.42	0.73	2.88
1-5	-1.49	1.07	3.63
1-6	-2.44	1.07	4.58
7-8	-2.94	0.17	3.27
7-5	-2.90	0.50	3.90
7-6	-3.66	0.50	4.66
8-5	-2.77	0.33	3.44
8-6	-3.59	0.33	4.26
5-6	-4.16	0.00	4.16

Alpha=0.05. Confidence=0.95. df=33. MSE=1.105. Critical Value of Studentized Range=4.572.

Comparisons significant at the 0.05 level are indicated by ***.

Table 20

Mean Score for Percentage of Faculty Effort Spent on Research
(Variable 15) by College

Var.	A & S (N)	Arch. (N)	J & C (N)	Eng. (N)	Bus. (N)	Ed. (N)	F Art (N)	HHP (N)
15	2.07 (15)	2.80 (5)	4.67 (3)	2.10 (10)	1.00 (2)	1.00 (1)	1.50 (2)	1.34 (3)

their departments take to graduate. Chairs in the five colleges noted above where significant differences existed perceived this variable to make slight to no contribution to extended undergraduate degree programs.

Table 21 reports the analysis of variance results for variable 19. The F value of 2.52 and the $Pr > F$ value of .0343 was significant at the .05 level. Table 22 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 19 by college. The posthoc analysis revealed that while variable 19, the number of upper division courses taught by adjunct faculty, instructors or teaching assistants each semester, was significant overall, no significant pair comparisons existed. The overall mean score for variable 19 was 2.29 indicating that, in general, this variable made a slight contribution.

Table 21

Analysis of Variance for Number of Upper Division Courses Taught by Adjunct Faculty, Instructors, or Teaching Assistants (Variable 19)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	36.39	5.19	2.52	0.0343
Error	33	68.10	2.06		
Corrected Total	40	104.49			
R-Square	C.V.	Root MSE	FACTOR19 Mean		
0.348	62.657	1.437	2.293		

Table 23 reports the analysis of variance results for variable 21. The F value of 2.60 and the Pr > F value of .0298 was significant at the .05 level. Table 24 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 21 by college. The significant comparison for variable 21 was Architecture and Liberal Arts & Sciences. The difference in means between Architecture and Liberal Arts & Sciences was 2.07. The mean for Architecture was 4.80 and the mean for Liberal Arts & Sciences was 2.73. Department heads in Architecture perceived degree requirements to be a strong contributor to extending undergraduate students' time

Table 22

Tukey's Studentized Range (HSD) Test for Number of Upper Division Courses Taught by Adjunct Faculty, Instructors, or Teaching Assistants (Variable 19) by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
7-2	-2.49	1.40	5.29
7-3	-2.24	2.00	6.24
7-8	-1.91	2.33	6.57
7-4	-0.70	2.90	6.50
7-1	-0.16	3.33	6.83
7-5	-0.64	4.00	8.64
7-6	-1.69	4.00	9.69
2-3	-2.79	0.60	3.99
2-8	-2.46	0.933	4.33
2-4	-1.04	1.50	4.04
2-1	-0.47	1.93	4.33
2-5	-1.29	2.60	6.49
2-6	-2.49	2.60	7.69
3-8	-3.46	0.33	4.13
3-4	-2.16	0.90	3.96
3-1	-1.60	1.33	4.27
3-5	-2.24	2.00	6.24
3-6	-3.36	2.00	7.36
8-4	-2.49	0.57	3.62
8-1	-1.94	1.00	3.94
8-5	-2.57	1.67	5.91
8-6	-3.70	1.67	7.03
4-1	-1.46	0.43	2.33
4-5	-2.50	1.10	4.70
4-6	-3.77	1.10	5.97
1-5	-2.83	0.67	4.16
1-6	-4.13	0.67	5.46
5-6	-5.69	0.00	5.69

Alpha=0.05. Confidence=0.95. df=33. MSE=2.064. Critical Value of Studentized Range=4.572.

Comparisons significant at the 0.05 level are indicated by ***.

Table 23

Analysis of Variance for Degree Requirements (Variable 21)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	27.55	3.94	2.60	0.0298
Error	33	49.97	1.51		
Corrected Total	40	77.51			

R-Square	C.V.	Root MSE	FACTOR21 Mean
0.3553	36.558	1.231	3.366

to graduation while their colleagues in Liberal Arts & Sciences see the same factor as having slight to moderate influence.

Table 25 reports the analysis of variance results for variable 22. The F value of 3.76 and the Pr > F value of .0042 was significant at the .05 level. Table 26 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 22 by college. The significant comparison for variable 22 was Architecture and Liberal Arts & Sciences. The difference in means between Architecture and Liberal Arts & Sciences was 2.93. The mean for Architecture was 4.80 while the mean for Liberal Arts & Sciences was 1.87. This

Table 24

Tukey's Studentized Range (HSD) Test for Degree Requirements
(Variable 21) by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
2-3	-2.77	0.13	3.04
2-7	-2.53	0.80	4.13
2-4	-0.98	1.20	3.38
2-1	0.01	2.07	4.12***
2-8	-0.77	2.13	5.04
2-5	-0.03	2.30	5.63
2-6	-1.56	2.80	7.16
3-7	-2.97	0.67	4.30
3-4	-1.55	1.07	3.69
3-1	-0.58	1.93	4.45
3-8	-1.25	2.00	5.25
3-5	-1.47	2.17	5.80
3-6	-1.93	2.67	7.26
7-4	-2.68	0.40	3.48
7-1	-1.73	1.27	4.26
7-8	-2.30	1.33	4.97
7-5	-2.48	1.50	5.48
7-6	-2.87	2.00	6.87
4-1	-0.76	0.87	2.49
4-8	-1.69	0.93	3.55
4-5	-1.98	1.10	4.18
4-6	-2.57	1.60	5.77
1-8	-2.45	0.07	2.58
1-5	-2.76	0.23	3.23
1-6	-3.38	0.73	4.84
8-5	-3.47	0.17	3.80
8-6	-3.93	0.67	5.26
5-6	-4.37	0.50	5.37

Alpha=0.05. Confidence=0.95. df=33. MSE=1.514. Critical Value of Studentized Range=4.572.

Comparisons significant at the 0.05 level are indicated by ***.

Table 25

Analysis of Variance for Accrediting Requirements (Variable 22)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	44.37	6.34	3.76	0.0042
Error	33	55.63	1.69		
Corrected Total	40	100.00			

R-Square	C.V.	Root MSE	FACTOR22 Mean
0.4437	43.280	1.298	3.000

implies that more stringent requirements are placed on Architecture programs by professional associations which accredit the program than are placed on programs in Liberal Arts & Sciences. These requirements from outside agencies extend the time necessary for students to complete degrees in the College of Architecture.

Table 27 reports the analysis of variance results for variable 23. The F value of 2.49 and the Pr > F value of .0367 was significant at the .05 level. Table 28 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 23 by college. The significant comparison for variable 23 was Architecture and Liberal Arts & Sciences.

Table 26

Tukey's Studentized Range (HSD) Test for Accrediting Requirements (Variable 22) by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
6-2	-4.40	0.20	4.80
6-3	-3.85	1.00	5.85
6-7	-3.64	1.50	6.64
6-4	-2.70	1.70	6.10
6-8	-2.85	2.00	6.85
6-5	-2.74	2.50	7.64
6-1	-1.20	3.13	7.47
2-3	-2.27	0.80	3.87
2-7	-2.21	1.30	4.81
2-4	-0.80	1.50	3.80
2-8	-1.27	1.80	4.87
2-5	-1.21	2.30	5.81
2-1	0.77	2.93	5.10***
3-7	-3.33	0.50	4.33
3-4	-2.06	0.70	3.46
3-8	-2.43	1.00	4.43
3-5	-2.33	1.50	5.33
3-1	-0.52	2.13	4.79
7-4	-3.05	0.20	3.45
7-8	-3.33	0.50	4.33
7-5	-3.20	1.00	5.20
7-1	-1.53	1.63	4.79
4-8	-2.46	0.30	3.06
4-5	-2.45	0.80	4.05
4-1	-0.28	1.43	3.15
8-5	-3.33	0.50	4.33
8-1	-1.52	1.13	3.79
5-1	-2.53	0.63	3.79

Alpha=0.05. Confidence=0.95. df=33. MSE=1.686. Critical Value of Studentized Range=4.572.

Comparisons significant at the 0.05 level are indicated by ***.

Table 27

Analysis of Variance for Admissions Requirements for Limited Access Programs (Variable 23)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	28.14	4.02	2.49	0.0367
Error	32	51.63	1.61		
Corrected Total	39	79.78			

R-Square	C.V.	Root MSE	FACTOR23 Mean
0.353	52.382	1.270	2.425

The difference in means between the two colleges was 2.20. The mean for Architecture was 4.20 and the mean for Liberal Arts & Sciences was 2.00. Admissions requirements for limited access programs make a stronger contribution to extending the time undergraduate students in the College of Architecture take to graduate than these requirements do for students in Liberal Arts & Sciences. Department chairs in Liberal Arts & Sciences indicated that this variable made a slight contribution to extended time to degree completion while those in Architecture rated this variable as an above average contributor.

Table 29 reports the analysis of variance results for variable 26. The F value of 5.60 and the Pr > F value of .0003 was significant at the .05 level. Table 30 reports the

Table 28

Tukey's Studentized Range (HSD) Test for Admissions Requirements for Limited Access Programs (Variable 23) by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
2-3	-2.14	0.87	3.87
2-7	-1.74	1.70	5.14
2-4	-0.55	1.70	3.95
2-1	0.06	2.20	4.34***
2-5	-0.74	2.70	6.14
2-8	-0.14	2.87	5.87
2-6	-0.31	3.20	7.71
3-7	-2.92	0.83	4.59
3-4	-1.88	0.83	3.54
3-1	-1.28	1.33	3.95
3-5	-1.92	1.83	5.59
3-8	-1.36	2.00	5.36
3-6	-2.42	2.33	7.09
7-4	-3.19	0.00	3.19
7-1	-2.61	0.50	3.61
7-5	-3.12	1.00	5.12
7-8	-2.60	1.17	4.92
7-6	-3.54	1.50	6.54
4-1	-1.20	0.50	2.20
4-5	-2.19	1.00	4.19
4-8	-1.54	1.17	3.88
4-6	-2.82	1.50	5.82
1-5	-2.61	0.50	3.61
1-8	-1.95	0.67	3.28
1-6	-3.26	1.00	5.26
5-8	-3.59	0.17	3.92
5-6	-4.54	0.50	5.54
8-6	-4.42	0.33	5.09

Alpha=0.05. Confidence=0.95. df=32. MSE=1.614. Critical Value of Studentized Range=4.581.

Comparisons significant at the 0.05 level are indicated by ***.

Table 29

Analysis of Variance for General Education and Gordon Rule Course Sections (Variable 26)

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	37.88	5.41	5.60	0.0003
Error	32	30.90	0.97		
Corrected Total	39	68.78			
R-Square	C.V.	Root MSE	FACTOR26 Mean		
0.551	29.554	0.983	3.325		

posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level of significance for variable 26 by college. The significant comparisons for variable 26 by college were Journalism & Communications and Business, Journalism & Communications and Health & Human Performance, Engineering and Business, and Engineering and Health & Human Performance. The difference in means between Journalism & Communications and Business was 4.00. The difference in means between Journalism & Communications and Health & Human Performance was 4.00. The difference in means between Engineering and Business was 3.30. The difference in means between Engineering and Health & Human Performance was

Table 30

Tukey's Studentized Range (HSD) Test for General Education
and Gordon Rule Course Sections (Variable 26) by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
3-4	-1.77	0.70	3.17
3-2	-1.06	1.60	4.26
3-1	-0.66	1.73	4.13
3-6	-1.90	2.00	5.90
3-7	-0.18	3.00	6.18
3-8	0.43	3.33	6.24***
3-5	0.82	4.00	7.18***
4-2	-0.84	0.90	2.64
4-1	-0.27	1.03	2.33
4-6	-2.04	1.30	4.64
4-7	-0.17	2.30	4.77
4-8	0.54	2.63	4.73***
4-5	0.83	3.30	5.77***
2-1	-1.51	0.13	1.78
2-6	-3.09	0.40	3.89
2-7	-1.26	1.40	4.06
2-8	-0.59	1.73	4.06
2-5	-0.26	2.40	5.06
1-6	-3.02	0.37	3.55
1-7	-1.13	1.27	3.66
1-8	-0.41	1.60	3.61
1-5	-0.13	2.27	4.66
6-7	-2.90	1.00	4.90
6-8	-2.34	1.33	5.01
6-5	-1.90	2.00	5.90
7-8	-2.57	0.33	3.24
7-5	-2.18	1.00	4.18
8-5	-2.24	0.67	3.57

Alpha=0.05. Confidence=0.95. df=32. MSE=0.966. Critical Value of Studentized Range=4.581.

Comparisons significant at the 0.05 level are indicated by ***.

2.63. Table 31 shows the mean scores for these four colleges on variable 26. Department chairs in both Journalism & Communications and Engineering view the number of course sections offered each semester for general education and Gordon Rule courses as a strong contributor to extending the time undergraduate students take to graduate while their colleagues in Business and Health & Human Performance view this variable as one of slight to no importance.

Table 31

Mean Scores on General Education and Gordon Rule Course Sections (Variable 26) for the Colleges of Journalism & Communications, Engineering, Business, and Health & Human Performance

Variable	J & C (N)	Eng. (N)	Bus. (N)	HHP (N)
26	5.00 (2)	4.30 (10)	1.00 (2)	1.67 (3)

As a result of this analysis, null hypothesis one was rejected. The full model was significant.

Analysis of Variance for Grouped Variables

After multivariate analysis of variance was conducted for the 28 individual variables, the same type of analysis was conducted for grouped variables.

Table 32 reports the analysis of variance for the area of resource allocation. The F value of 1.93 and the $Pr > F$ value of .0965 was not significant at the .05 level. As a result of this analysis, null hypothesis two failed to be rejected for the dependent variable resource allocation.

Table 33 reports the analysis of variance for the area of faculty effort. The F value of 2.62 and the $Pr > F$ value of .0289 was significant at the .05 level by college. Table 34 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level for the area of faculty effort by college. The significant comparison by college in the area of faculty effort was Architecture and Business. The difference in means between Architecture and Business was 2.29. The overall mean for the College of Architecture in the area of faculty effort was 3.35. Department chairs in this college perceived faculty effort as moderately contributing to extending time to graduation for undergraduate students. The overall mean for the College of Business in the area of faculty effort was 1.06 which indicates that faculty effort factors have no impact on extended time to degree for undergraduate students in the College of Business. It is interesting to note that for the eight variables that comprise the area of faculty effort, with the exception of variable 12, number of faculty holding doctoral degrees, all other variables had a mean score of 2.80 or higher for the College of Architecture. In

Table 32

Analysis of Variance for Resource Allocation

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	524.28	74.90	1.93	0.0965
Error	33	1282.50	38.86		
Corrected Total	40	1806.78			
R-Square		C.V.	Root MSE	RESALL Mean	
0.290		20.831	6.234	29.927	

Table 33

Analysis of Variance for Faculty Effort

Source	DF	Sum of Squares	Mean Square	F value	PR > F
Model	7	768.87	109.84	2.62	0.0289
Error	33	1385.13	41.97		
Corrected Total	40	2154.00			
R-Square		C.V.	Root MSE	FACEFF Mean	
0.357		32.394	6.479	20.000	

Table 34

Tukey's Studentized Range (HSD) Test for Faculty Effort by College

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
2-7	-15.72	1.80	19.32
2-3	-13.16	2.13	17.43
2-8	-10.16	5.13	20.43
2-4	- 4.37	7.10	18.57
2-1	- 2.22	8.60	19.42
2-6	- 6.14	16.80	39.74
2-5	0.78	18.30	35.82***
7-3	-18.79	0.33	19.45
7-8	-15.79	3.33	22.45
7-4	-10.92	5.30	21.52
7-1	- 8.97	6.80	22.57
7-6	-10.65	15.00	40.65
7-5	- 4.44	16.50	37.44
3-8	-14.10	3.00	20.10
3-4	- 8.82	4.97	18.75
3-1	- 6.78	6.47	19.71
3-6	- 9.52	14.67	38.85
3-5	- 2.95	16.17	35.29
8-4	-11.82	1.97	15.75
8-1	- 9.78	3.47	16.71
8-6	-12.52	11.67	35.85
8-5	- 5.95	13.17	32.29
4-1	- 7.05	1.50	10.05
4-6	-12.27	9.70	31.67
4-5	- 5.02	11.20	27.42
1-6	-13.43	8.20	29.83
1-5	- 6.07	9.70	25.47
6-5	-24.15	1.50	27.15

Note: These figures represent the sum of responses on the eight variables in the area of faculty effort and were not adjusted to the 5-point scale.

Alpha=0.05. Confidence=0.95. df=33. MSE=41.974. Critical Value of Studentized Range=4.572.

Comparisons significant at the 0.05 level are indicated by ***.

the College of Business, the mean scores for all eight variables in this area were 1.0 with the exception of variable 14 with a mean score of 1.5. Department chairs in Architecture perceived that how faculty allocate their time does have a moderate to strong impact on student progress through undergraduate degree programs while their colleagues in Business did not see this as an area of importance.

Table 35 reports the analysis of variance for the area of curricular and program issues. The F value of 4.32 and the $Pr > F$ value of .0017 was significant at the .05 level by college. Table 36 reports the posthoc test results. Tukey's Studentized Range Test was used to determine which of the pairs was significantly different from each other at the .05 level for the area of curricular and program issues by college. The significant comparisons by college in the area of curricular and program issues were Architecture and Liberal Arts & Sciences and Architecture and Business. The difference in means between Architecture and Liberal Arts & Sciences was 2.23. The difference in means between Architecture and Business was 2.50. The overall mean for the College of Architecture for the area of curricular and program issues was 4.50. The overall mean for the College of Liberal Arts & Sciences for the area of curricular and program issues was 2.27. The overall mean for the College of Business for the area of curricular and program issues was 2.00. Table 37 shows a comparison for each of the three

Table 35

Analysis of Variance for Curricular and Program Issues

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	411.45	58.79	4.32	0.0017
Error	33	449.33	13.62		
Corrected Total	40	860.78			

R-Square	C.V.	Root MSE	CURRPRO Mean
0.478	30.939	3.690	11.927

colleges for the four individual variables that comprise the area of curricular and program issues. From the analysis of variance conducted on the 28 individual variables, variables 21, 22, and 23 emerged as significant with pairwise comparisons indicating significant differences between the Colleges of Architecture and Liberal Arts & Sciences. As is depicted in Table 37, for each of the variables in the area curricular and program issues, department chairs in the College of Architecture assigned a much higher rating than their colleagues in Liberal Arts & Sciences and Business.

Table 38 reports the analysis of variance for the area of logistical issues. The F value of 1.48 and the Pr > F value of .2074 was not significant at the .05 level. As a

Table 36

Tukey's Studentized Range (HSD) Test for Curricular and Program Issues

College Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
2-3	- 5.71	3.00	11.71
2-4	- 2.13	4.40	10.93
2-7	- 4.98	5.00	14.98
2-6	- 5.07	8.00	21.07
2-8	- 0.71	8.00	16.71
2-1	2.77	8.93	15.09***
2-5	0.02	10.00	19.98***
3-4	- 6.45	1.40	9.25
3-7	- 8.89	2.00	12.89
3-6	- 8.77	5.00	18.77
3-8	- 4.74	5.00	14.74
3-1	- 1.61	5.93	13.48
3-5	- 3.89	7.00	17.89
4-7	- 8.64	0.60	9.84
4-6	- 8.91	3.60	16.11
4-8	- 4.25	3.60	11.45
4-1	- 0.34	4.53	9.40
4-5	- 3.64	5.60	14.84
7-6	-11.61	3.00	17.61
7-8	- 7.89	3.00	13.89
7-1	- 5.05	3.93	12.91
7-5	- 6.93	5.00	16.93
6-8	-13.77	0.00	13.77
6-1	-11.39	0.93	13.25
6-5	-12.61	2.00	16.61
8-1	- 6.61	0.93	8.48
8-5	- 8.90	2.00	12.89
1-5	- 7.91	1.07	10.05

Note: These figures represent the sum of responses on the four variables in the area of faculty effort and were not adjusted to the 5-point scale.

Alpha=0.05. Confidence=0.95. df=33. MSE=13.616. Critical Value of Studentized Range=4.572.

Comparisons significant at the 0.05 level are indicated by ***.

Table 37

Mean Scores for Individual Variables in the Area Curricular and Program Issues for the Colleges of Architecture, Liberal Arts & Sciences, and Business

Variable	Archit.	A & S	Business
20. Knowledge explosion--rapid growth in the body of knowledge associated with the discipline which increases the content and complexity of courses.	4.20 (5)	2.60 (15)	1.50 (2)
21. Degree requirements--includes credit hours required to graduate, sequenced course obligations, core curriculum requirements, and experiential learning situation.	4.80 (5)	2.73 (15)	2.50 (2)
22. Requirements placed on academic programs by professional associations which accredit the program and/or certificate and licensure requirements.	4.80 (5)	1.87 (15)	2.50 (2)
23. Admissions requirements for limited access programs	4.20 (5)	2.00 (14)	1.5 (2)

Table 38

Analysis of Variance for Logistical Issues

Source	DF	Sum of Squares	Mean Square	F value	Pr > F
Model	7	144.08	20.58	1.48	0.2074
Error	33	457.97	13.88		
Corrected Total	40	602.05			

R-Square	C.V.	Root MSE	LOGIST Mean
0.239	23.680	3.725	15.732

result of this analysis null hypothesis two failed to be rejected for the dependent variable logistical issues.

As a result of this analysis, null hypothesis two was rejected at the .05 level of significance. The full model was significant.

Qualitative Survey Responses

The last question on the survey asked department heads to provide comments on additional institutional factors which influence undergraduate students' time to graduation.

Although this study focused only on institutional factors extending undergraduate students time to graduation, comments made by department heads regarding additional factors which extend undergraduate students' time to graduation indicated a

belief that both institutional and student factors contribute to extended undergraduate degree programs.

From an institutional perspective, these comments intimated that undergraduate student advising and tuition pricing policies were important factors in contributing to extended degree programs. Comments regarding advisement revealed that lack of advising or poor advising contributed to longer time to degree.

The most important factor contributing to the extension of the graduation time is the poor advising freshmen and sophomores receive during their first two years at UF. The students and departments spend a lot of time during the subsequent years to undo the damage. The resources spent in the advising center should be given to the departments and have faculty advise those students who have indicated interest in their department. A skeletal advising center should be kept for those students who have no preference for any discipline.

The lack of advising at the major probably slows them down considerably.

The new advisement and registration procedures being implemented campus-wide seem to be discouraging students from seeking advisement, thus extending their programs.

One respondent remarked that lack of faculty resources for lower division courses augments the problem.

Several department chairs commented that the current per credit hour tuition pricing structure caused students to take lighter course loads because of the cost factors involved.

Load is often determined by cost per credit hour rather than desire to graduate.

Charging students by the credit hour--a flat rate fee for, say 12-18 hours, would provide incentive for students to take more hours per term and thus finish faster.

Respondents also noted that cuts in financial aid and the need for many students to work to stay in school complicated problems associated with current tuition pricing policies.

In both the Colleges of Business and Liberal Arts & Sciences, respondents reported a lack of faculty necessary to provide quality undergraduate programs and services.

We don't have enough faculty independent of their salaries. People leave or retire and we do not replace them and offer fewer sections.

My department does not have the number of faculty it needs by half. We are far smaller as a unit than our peers at other selective state universities.

In the College of Architecture, one respondent reported that for his program national trends pointed to a 5-year degree and further stated that students were now being required to have specialized degrees in addition to the bachelor's degree.

In the College of Liberal Arts & Sciences, department chairs indicated that "students can not get the classes they need for a variety of reasons--shrinkage in the number of faculty, inadequate classrooms, inadequate number of TAs, and a reluctance to teach or take classes at night." Because of this many students are forced to redesign their programs of study and often end up taking "filler" courses in an attempt to keep up credit hours.

Additional institutional factors that department chairs indicated extend time to graduation included the following:

1. Too many required/specified courses.
2. Coursework inflation.
3. Lack of OPS funds to offer more undergraduate sections.

4. Lack of adequate classroom space for undergraduate lower division courses.
5. Too much freedom of choice over when prerequisite courses can be taken.

Several of the survey respondents cited student factors as responsible for extended undergraduate degree programs and, in some cases, stated that institutional factors were not a contributing factor to extended degree programs. Two department chairs responded,

You are concentrating on second order issues and ignoring the dominant factors: (1) students choose to take fewer courses; (2) they place a higher value on the grade than the time to graduate; (3) they value extracurricular experience over cost; and (4) they like it here--they are not in a hurry to face a tough job market and to pay back loans.

You did not address student issues which rate a 5. You must talk with students. Some issues: (1) need to hold a job part time; (2) co-op and internships; and (3) 12 credit per term psychology--minimum for financial aid becomes the maximum.

A department chair in Liberal Arts & Sciences remarked, "Student related factors have a strong impact, e.g., jobs, finances, family circumstances, indecision about career choices." Two respondents pointed to the generally low standard of achievement reached by students before entering college as a significant factor in extending time to graduation. One observed,

The most important factor by far and very important in Florida is the lack of preparation of students. Students from very many high schools do not receive strong preparation in math, English, and physical sciences. The universities have the burden of trying to correct this.

Student indecision with respect to choice of major was cited by several respondents as having an influence on

extended time to graduation. Department chairs did feel they could not eliminate changing majors and believed it important for students to continue to have choice and flexibility in this area.

Summary of the Findings

This study was designed to analyze the perceptions and attitudes of higher education administrators regarding institutional factors which extend time to degree attainment for undergraduate students at a major public research university in the Southeast. In particular, this study assessed the perceptions of department heads in eight undergraduate colleges supported by Educational and General funds. In order to investigate these factors, a survey instrument was developed which measured the contribution 28 individual institutional variables had on extending the time undergraduate students take to graduate. These variables were grouped in four areas: resource allocation, faculty effort, curricular and program issues, and logistical issues. An open-ended question was included asking department heads to identify additional institutional factors which influence undergraduate students' time to graduation. Surveys were mailed to 55 department heads and returned by 47 department heads. The data were analyzed by determining the means, frequency distributions, and standard deviations. College membership was considered in analyzing these data.

Multivariate analyses of variance were conducted using the eight colleges as independent variables. The dependent variables were (a) the 28 individual institutional variables and (b) the four groups of institutional variables.

In the analysis of the 28 individual variables, 11 variables were found to be significant. These variables were as follows:

Variable 1: Percentage of resources invested in salaries and benefits for faculty

Variable 3: Percentage of resources invested in operating expenses

Variable 4: Percentage of resources devoted to operating capital outlay

Variable 11: Optimum class size for upper division courses

Variable 14: Percentage of faculty effort spent on academic advising

Variable 15: Percentage of faculty effort spent on research

Variable 19: Number of upper division course sections taught by adjunct faculty, instructors, or teaching assistants each semester

Variable 21: Degree requirements--includes credit hours required to graduate, sequenced course obligations, core curriculum requirements, and experiential learning situations

Variable 22: Requirements placed on academic programs by professional association which accredit the program and/or certificate and licensure requirements

Variable 23: Admissions requirements for limited access programs

Variable 26: Number of course sections offered each semester for general education and Gordon Rule courses

In the analysis of grouped institutional variables, significant differences were found in the areas of faculty effort and curricular and program issues.

Qualitative survey comments indicated that department chairs consider both institutional and student factors to extend time to graduation. Additional institutional factors cited as extending the time undergraduate students take to graduate were poor advisement, per credit hour tuition pricing, lack of OPS funds, too many required courses, inadequate number of faculty, and insufficient classroom space.

CHAPTER V SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Review of the Study

After decades of growth and prosperity, postsecondary institutions faced increasing financial stress and waning public support in the early 1990s. Issues of financial constraint on the part of students, their families, and institutions; accountability; and concern over the outcomes of the undergraduate experience emerged as increasingly important topics in higher education in the decade of the 1980s and remained critical during the 1990s (Knight, 1994).

For public colleges and universities, the nationwide economic slump caused severe restrictions in state appropriations to higher education. The slowdown of the economy which began in the 1980s continued into the 1990s causing many state legislatures to give higher education spending a low priority. Legislators, taxpayers, students, and their parents put renewed pressure on higher education institutions to document both their efficiency and effectiveness and demonstrate that students were receiving substantial benefits for their investment in higher education. Knight (1994) noted, "An emerging issue manifested by these concerns over the last several years has

been the length of time necessary for students to complete bachelors degrees" (p.3). Federal legislation reflected these concerns. The Students' Right-to-Know and Campus Security Act of 1990 required that all higher education institutions receiving federal funds report graduation rates on an annual basis.

Interest in shortening time to complete a bachelor's degree was a response to productivity and accountability concerns, interpreted in terms of resource allocation and access demands (Blanco, 1994). The phrase, "doing more with less," became widespread throughout higher education. When assessing time to degree,

"doing more" from the state perspective means producing graduates in less time, particularly in high-market-demand fields; it means carrying more students to degree completion for institutions; and for students it means optimizing alternatives that foster completion of the degree in a shortened time period. (Blanco, 1994, p.1)

The purpose of this study was to analyze the perceptions and attitudes of higher education administrators regarding institutional factors which extend time-to-degree attainment for undergraduate students at a major public research university in the Southeast. In particular, this study assessed the perceptions and attitudes of department heads in undergraduate colleges supported by Education and General funds.

This study addressed the following questions:

1. What individual institutional variables and groups of variables extend time to degree for undergraduate students as perceived by department heads?

2. Is there a difference among colleges in the perceptions of department heads regarding individual institutional variables which extend time to degree for undergraduate students?

3. Is there a difference among colleges in the perceptions of department heads regarding grouped institutional variables which extend time to degree for undergraduate students?

After a review of literature was completed, a survey instrument was developed to measure the perceptions of higher education administrators concerning institutional factors which extend time to graduation for undergraduate students. The survey was developed after reviewing the literature regarding both educational attainment and time to degree. Institutional factors influencing educational attainment and time to degree were identified and grouped into four categories: resource allocation, faculty effort, curricular and program issues, and logistical issues. A Likert scale survey was developed to assess the perceptions of department heads concerning how important each of the 28 variables identified above was in extending undergraduate students' time to graduation. The survey was reviewed by a research expert for content validity. Revisions were made to some questions to remedy problems with wording and improve clarity. The survey was then pilot tested on several department heads in the College of Education. Department heads were asked to complete the survey and comment about any

areas of the survey and accompanying materials that needed clarification.

The survey was mailed to all 55 department heads in the eight undergraduate colleges supported by Education and General funds. A total of 47 surveys were returned for a response rate of 85%. Descriptive statistics including means, standard deviations, and frequency distributions were computed for each survey item and for the four groups of variables both for all survey respondents and for respondents grouped by college.

After compiling this descriptive data, multivariate analysis of variance (MANOVA) was used in determining the significant institutional factors, both individual and grouped, influencing time to degree as perceived by department heads. This method of analysis was selected because it allowed the researcher to determine whether several groups, in this case department heads from the eight colleges supported by Education and General funds, differed on more than one dependent variable. Multivariate analyses of variance were conducted using college as the independent variable. The dependent variables were (a) the 28 individual variables and (b) the four grouped variables: resource allocation, faculty effort, curricular and program issues, and logistical issues.

Conclusions and Implications of the Study

From the descriptive analysis, four variables emerged with mean scores of 3.50 indicating that, in general, department heads found these institutional factors to have an above-average to strong contribution to extending the time undergraduate students take to graduate. These variables were number of teaching faculty employed, scheduling of classroom space, liberal nature of course drop and/or withdrawal policies, and faculty/student ratio. Based on the literature, it is not surprising that these variables would be important influences on students' time to graduation. Pascarella and Terenzini (1991) and Tinto (1975) cited the importance of faculty/student contact on student persistence. In an analysis of time to degree at Iowa's public universities, KPMG Peat Marwick (1989) noted that the scheduling of classroom space often resulted in artificial enrollment limitations which impede access to classes for students. The University of North Carolina (1993) reported that course withdrawal or repeat policies facilitated student behaviors which lengthen time to degree, and Knight (1994) suggested that limiting course dropping behavior will decrease time to degree.

Given the above-average contribution these four factors have on extending the time undergraduate students take to graduate, several action plans can be implemented by colleges and universities to assist students in timely degree

completion. First, it would be helpful to review course drop and withdrawal policies and restructure these policies in a manner which holds students more accountable. Second, a supply/demand analysis of classroom space would insure that limited space is being utilized in the most efficient manner. Third, departments would benefit from establishing the optimum faculty/student ratio needed to deliver quality instruction and services to students and develop resource allocation plans to meet this goal. Finally, it would be worthwhile to examine ways technology might be used to reduce the number of faculty required to deliver services to students effectively and efficiently.

The hypotheses testing yielded several significant findings. Although the area of resource allocation was not significant overall, several individual variables in this area were significant and varied by college. These variables were percentage of resources invested in salaries and benefits for faculty (no significant comparisons between colleges), percentage of resources invested in operating expenses (significant comparisons between the College of Fine Arts and the Colleges of Liberal Arts & Sciences, Engineering, Business, and Health & Human Performance and the College of Architecture and the Colleges of Liberal Arts & Sciences, Business, and Health & Human Performance), and percentage of resources devoted to operating capital outlay (significant comparison between the Colleges of Journalism & Communications and Liberal Arts & Sciences). It is not

surprising that some individual variables in this area were significant since the 1990s was a time of increased cost pressures in an environment of limited resources. Hauptman (1993) suggested the following as critical questions for higher education leaders:

1. How do colleges and universities finance themselves?
2. How is the money spent?
3. How do spending patterns affect student learning and degree completion?

Odden and Massey (1992) noted, "Professors' salaries would need to rise by an amount equal to the inflation rate plus the increase in productivity for higher education to remain competitive" (p. 13) and further acknowledged that the continuous layering of new ideas, methods, and programs on top of old ones resulted in a constant pressure to add technology and facilities. Lengthened enrollments produce a drain on limited resources. The findings indicated that resource allocation factors have varying implications for degree completion for each of the eight colleges. In order to facilitate time to degree, colleges must have the flexibility to allocate resources in a manner they deem appropriate so each college can efficiently deliver quality services to their students in a resource constrained environment.

Responses in the area of faculty effort when compared by college yielded significant differences. The following individual variables were significant and differed by

college: percentage of faculty effort spent on academic advising (significant comparison between the Colleges of Liberal Arts & Sciences and Architecture), percentage of faculty effort spent on research (significant comparisons between the College of Journalism & Communications and the Colleges of Liberal Arts & Sciences, Engineering, Business, Fine Arts, and Health and Human Performance), and number of upper division course sections taught by adjunct faculty, instructors, or teaching assistants each semester (no significant comparisons between colleges). Odden and Massey (1992) noted that faculty priorities have changed over the past several decades. By the early 1990s, faculty no longer devoted the majority of their time to teaching and related activities such as academic advising and mentoring; instead, faculty spent more time on research and scholarship because curriculum changes and increases in support staff allowed this flexibility.

The results of this study revealed that colleges with strong advising centers did not perceive advising as a concern, while those without such an entity indicated that the time faculty spend advising students plays a strong role in timely degree completion. To facilitate timely degree completion, the advising role within the colleges should be expanded. This can be done in several ways. An in-service workshop addressing advising issues and how to provide this service to students most effectively could be conducted with faculty. Automating the advising systems within the colleges

would remove the burden from faculty and staff while at the same time providing students with quality assistance. Finally, additional staff could be hired to perform advising functions within each of the colleges. In a resource-constrained environment, in-service education and automation appear the most feasible alternatives. If automated advising systems are implemented, college and university administrators must be careful not to sacrifice personal contact with faculty that is so important to students' persistence and completion.

This study's findings also indicated that individual colleges place varying degrees of importance on the role faculty effort spent on research plays in extending undergraduate students' time to graduation. Research is important because it generates revenue and because it allows faculty to stay current in their discipline and to sharpen and enhance their teaching skills. Colleges must establish a plan for allocating faculty time to meet the teaching, research, and service needs of their particular disciplines. Research goals for both revenue production and support and enhancement of teaching functions should be established by college and used as an accountability tool. Colleges which perceive faculty effort spent on research as a strong contributor to extended undergraduate degree programs should develop plans to reallocate faculty effort and minimize the impact of this factor.

The number of upper division course sections taught by adjunct faculty, instructors, or teaching assistants each semester was the final significant variable in the area of faculty effort. Because of the overall slight contribution department heads perceived this variable to make on extending the time undergraduate students take to graduate, colleges would benefit from assessing (a) what role these positions play within their disciplines, (b) the optimum number of these positions needed given their role, and (c) if resources devoted to these positions are being most effectively utilized.

The area of curricular and program issues was also significant with three of the four individual variables in this section being significant and varying by college. These variables were degree requirements, requirements placed on academic programs by professional associations which accredit the program and/or certificate and licensure requirements, and admissions requirements for limited access programs. The significant comparison for each of these variables was between the Colleges of Architecture and Liberal Arts & Sciences. These findings are reflective of what has emerged through previous time-to-degree studies. KPMG Peat Marwick (1989) in an analysis of time to degree at Iowa's public universities determined that degree requirements including prerequisite courses, strict admissions requirements for limited access programs, and requirements imposed on programs by the state or external agencies all created problems for

students in completing degree programs in 4 years. The Illinois State Board of Higher Education (1992) found that degree requirements and specification of courses within majors were institutional policies and practices that impacted time to degree. The University of North Carolina (1993) reported increased participation in internship, practica, and cooperative education experiences influenced time to graduation. Because of stringent expectations placed on programs both by internal and external agencies and students' desire to enhance their educational experiences through experiential learning programs, college and university administrators should explore avenues to repackage traditional programs so expectations of all of these groups can be met and degree programs completed in a 4-year period. This repackaging should include an analysis of both the curriculum structure and delivery systems and requires a movement away from the mentality that the way institutions provide services is fixed. Repackaging could include increased use of technology and distance learning, redesign of course content, or reconfiguration of the traditional 12-15 credit semester. Faculty must play an integral role in this redesign process as they are the primary instructional delivery agents. Restructuring assumes a paradigm shift from the way higher education has traditionally conducted business. Odden and Massey (1992) advocated for internal efficiency improvements and the use of technology to increase

productivity. Repackaging is necessary only for programs experiencing expanded curricular demands.

The area of logistical issues was not significant overall, although one variable, number of course sections offered each semester for general education and Gordon Rule courses, was significant (significant comparisons between the Colleges of Journalism & Communications and Engineering and the Colleges of Business and Health & Human Performance). Again, repackaging the current curriculum structure in given departments and/or colleges, as cited above, would address the significance this variable has on extending the time undergraduate students take to graduate.

Considerations for Future Research

Further investigation into issues closely related to those examined in the present study is certainly warranted based on the significance of institutional issues associated with extending undergraduate degree completion. A study which looks in-depth at the significant institutional factors extending time to degree for undergraduate students identified in this study would be a natural extension of the present study. This could be done by conducting qualitative interviews with department heads. Some possible questions for inclusion in these interviews are as follows:

1. How can current limited resources most effectively be allocated within your department to insure the effective

delivery of instruction to students and timely completion of undergraduate degree programs?

2. How can the advising services provided by your department be enhanced to better serve students?

3. What role does faculty effort spent on research play in extending undergraduate students' time to graduation?

4. How can the curriculum within your department be restructured to meet institutional expectations and those of accrediting agencies without extending undergraduate degree programs?

5. What are some ways that the current course withdrawal/drop policies can be modified to minimize student behavior that results in extended time to graduation?

6. How can general education and Gordon Rule requirements be met through courses taught in your department?

This study provided a thorough analysis of the perceptions of department heads regarding institutional factors which extend time to graduation for undergraduate students at a major public research university in the Southeast. Study into the perceptions of deans, faculty, and students on these same institutional factors is needed. The perceptions of deans can be assessed by conducting interviews to explore their assessment of the current study's findings. Faculty perceptions can be assessed by administering the survey used in the present study and conducting a similar analysis. The present survey would need slight modification

to analyze students' perceptions of institutional factors which extend time to graduation. Comparing and contrasting the perceptions of these various higher education constituents would yield valuable information on modifications necessary to current institutional policies and practices in order to facilitate time to degree.

Examinations of the effects of institutional factors on time to graduation at other types of higher education institutions may be beneficial. Research on institutional factors impacting educational attainment found that the characteristics of institutional size, type, control, and selectivity were related to student retention and persistence (Stoecker et al., 1988; Tinto, 1975; Velez, 1985). The same analysis conducted in the present study could be undertaken for various types of higher education institutions including community colleges, small private liberal arts institutions, large private institutions, and small to midsize public institutions. In addition to control and size, institutional selectivity should also be considered in identifying colleges and universities where the present study could be replicated.

Finally, a study which analyzes the ways in which faculty determine curriculum and program would be beneficial. This study would involve an in-depth evaluation of the role faculty play in determining what is taught, sequence and content of courses, and delivery of information and explore ways to restructure the curriculum in order to facilitate time to degree. Initial information could be gathered

through survey research. Findings revealed through the survey research could be explored in depth through structured interviews.

Given the significance of institutional factors in extending time to graduation for undergraduate students, the overwhelming concern of students, parents, and the public with lengthened undergraduate degree programs, an environment of limited resources, and the limited research in this area, any of the preceding suggested studies would be worthwhile in enlightening researchers and practitioners in the area of time to degree. Such research is certainly warranted given the importance of providing quality postsecondary education in a resource constrained environment.

Summary

This study analyzed the perceptions and attitudes of higher education administrators regarding institutional factors which extend time to degree attainment for undergraduate students at a major public research university in the Southeast. After reviewing the literature regarding both educational attainment and time to degree, 28 institutional variables were identified and grouped into four categories: resource allocation, faculty effort, curricular and program issues, and logistical issues. A Likert scale survey instrument was developed to assess the perceptions of department heads concerning how important each of the 28 variables was in extending undergraduate students time to

graduation. The survey was mailed to department heads in the eight undergraduate colleges supported by Education and General funds.

The researcher first analyzed the data by determining the means, standard deviations, and frequency distributions for the 28 individual variables and for the four groups of variables both for all survey respondents and for respondents grouped by college. After compiling these descriptive data, multivariate analysis of variance (MANOVA) was used in determining the significant institutional factors, both individual and grouped, influencing time to degree as perceived by department heads. Multivariate analyses of variance were conducted using college as the independent variable. The dependent variables were (a) the 28 individual institutional factors and (b) the four grouped variables: resource allocation, faculty effort, curricular and program issues, and logistical issues.

The study yielded the following findings:

1. Department heads overall perceived the following variables to make the strongest contribution to extending time to degree attainment for undergraduate students: faculty/student ratio, number of teaching faculty employed in the department, scheduling of classroom space, and the liberal nature of course drop and/or withdrawal policies. Variables perceived as making the least contribution were percentage of resources invested in salaries and benefits for A & P and USPS staff, number of faculty holding doctoral

degrees, percentage of faculty effort spent on research, number of upper and lower division course sections taught by adjunct faculty, instructors, or teaching assistants, and absence of a grade forgiveness policy.

2. Although the area of resource allocation was not significant overall, several individual variables in this area were significant and varied by college. These variables were percentage of resources invested in salaries and benefits for faculty (no significant comparisons between colleges), percentage of resources invested in operating expenses (significant comparisons between the College of Fine Arts and the Colleges of Liberal Arts & Sciences, Engineering, Business, and Health & Human Performance and the College of Architecture and the Colleges of Liberal Arts & Sciences, Business, and Health & Human Performance), and percentage of resources devoted to operating capital outlay (significant comparison between the Colleges of Journalism & Communications and Liberal Arts & Sciences). The findings indicated that resource allocation factors have varying implications for degree completion for each of the eight colleges. In order to facilitate time to degree, colleges must have the flexibility to allocate resources in a manner they deem appropriate.

3. Responses in the area of faculty effort when compared by college yielded significant differences. The following individual variables were significant: percentage of faculty effort spent on academic advising (significant

comparison between the Colleges of Liberal Arts & Sciences and Architecture), percentage of faculty effort spent on research (significant comparisons between the College of Journalism & Communications and the Colleges of Liberal Arts & Sciences, Engineering, Business, Fine Arts, and Health and Human Performance), and number of upper division course sections taught by adjunct faculty, instructors, or teaching assistants each semester (no significant comparisons between colleges). To facilitate timely degree completion (a) the advising role within the colleges should be expanded; (b) colleges must establish research goals for both revenue production and support and enhancement of teaching functions; and (c) colleges would benefit from assessing the role adjunct faculty, instructor, and teaching assistant positions play within their disciplines and determine if resources devoted to these positions are being most effectively utilized.

4. The area of curricular and program issues was also significant with three of the four individual variables in this section being significant. These variables were degree requirements, requirements placed on academic programs by professional associations which accredit the program and/or certificate and licensure requirements, and admissions requirements for limited access programs. The significant comparison for each of these variables was between the College of Architecture and the College of Liberal Arts & Sciences. College and university administrators should

explore restructuring the curriculum, course content, and current delivery systems to make more effective use of technology and distance education in programs experiencing expanded curricular demands.

5. The area of logistical issues was not significant overall, although one variable, number of course sections offered each semester for general education and Gordon Rule courses, was significant (significant comparisons between the Colleges of Journalism & Communications and Engineering and the Colleges of Business and Health & Human Performance). Again, repackaging the current curriculum structure in given departments and/or colleges, as cited above, would address the significance this variable has on extending the time undergraduate students take to graduate.

In an environment of limited resources and pressing accountability demands, time to graduation is an important concern for students, parents, the public, and higher education leaders. Because of the limited research in the area of institutional factors impacting time to degree, replication of the current study at different types of higher education institutions is warranted. Additionally, the study should be expanded to include students, faculty, and deans. Finally, an in-depth analysis of significant factors identified in this study should be conducted through structured interviews.

APPENDIX A
COVER MEMO WITH SURVEY

To: Department Heads
From: Andrew A. Sorenson
Provost
Subject: Time to Graduation Survey
Date: October 13, 1995

Issues of accountability, resource constraint, and outcomes assessment have caused time to graduation to emerge as an important area of concern for policymakers and college and university administrators. The Provost's Office in conjunction with the Institute of Higher Education at the University of Florida is conducting a study to assess the perceptions and attitudes of higher education administrators about the degree to which institutional factors contribute to extending the length of time necessary for students at the University of Florida to complete baccalaureate degree programs.

Enclosed you will find a survey which assesses institutional factors that may extend undergraduate students' time to graduation. The survey is brief and should only take 10-15 minutes to complete. Please complete the survey and return it to Dr. David S. Honeyman at the Institute of Higher Education in the enclosed envelope no later than November 13, 1995.

Upon completion of the data analysis, a copy of the report will be made available to you through the Institute of Higher Education. Thank you, in advance, for your assistance with this important project.

APPENDIX B
FOLLOW-UP MEMO TO DEPARTMENT HEADS

To: Department Heads

From: David S. Honeyman
Professor, Educational Leadership

Subject: Time to Graduation Survey

Date: October 25, 1995

I hope you have received the communication from the Provost's Office concerning the time to graduation study the Institute of Higher Education at the University of Florida is conducting in cooperation with Dr. Sorensen's office.

If you have already completed the survey and returned it to me, thank you for your assistance. If you have problems, questions, or failed to receive the initial mailing, please contact me at 392-2391 ext. 272. I would like to receive completed surveys by November 6, 1995.

Upon completion of the data analysis, a copy of the report will be made available to you through the Institute of Higher Education. I appreciate your assistance with this important project.

APPENDIX C ANALYSIS OF FACTORS EXTENDING UNDERGRADUATE STUDENTS' TIME TO GRADUATION

Resource Allocation

In periods of financial constraints and budget cuts, allocation of available funds and distribution of resources including equipment, supplies, and manpower may impact the institution's ability to graduate students in a timely manner. On a scale of 1 to 5 please rate the degree to which the following resource allocation issues contribute to extending the time undergraduate students in your department take to graduate.

	No Contribution			Moderate Contribution				Strong Contribution
	1	2		3	4			5
_____ 1.	Percentage of resources invested in salaries and benefits for faculty.							
_____ 2.	Percentage of resources invested in salaries and benefits for A & P and USPS staff.							
_____ 3.	Percentage of resources invested in operating expenses. This includes but is not limited to supplies, travel allowances, computer hardware and software, and contractual costs.							
_____ 4.	Percentage of resources devoted to operating capital outlay (equipment and furnishings).							
_____ 5.	Faculty/student ratio.							
_____ 6.	Number of A & P and USPS personnel employed.							
_____ 7.	Number of teaching faculty employed.							
_____ 8.	Class size for lower division courses.							
_____ 9.	Class size for upper division courses.							

For the next two questions, please check the appropriate response.

10. In your opinion, what is the optimum class size for lower division courses?

_____ 1-30 students _____ 31-60 students _____ 61-120 students
 _____ 120+ students

11. In your opinion, what is the optimum class size for upper division courses?

_____ 1-30 students _____ 31-60 students _____ 61-120 students
 _____ 120+ students

Faculty Effort

Student contact with faculty influences time to graduation. On a scale of 1 to 5 please rate the degree to which the following faculty effort issues contribute to extending the time undergraduate students in your department take to graduate.

No		Moderate		Strong
Contribution		Contribution		Contribution
1	2	3	4	5

- _____ 12. Number of faculty holding doctoral degrees.
- _____ 13. Percentage of faculty effort spent on instruction.
- _____ 14. Percentage of faculty effort spent on academic advising.
- _____ 15. Percentage of faculty effort spent on research.
- _____ 16. Number of lower division course sections taught by faculty holding rank each semester.
- _____ 17. Number of upper division course sections taught by faculty holding rank each semester.
- _____ 18. Number of lower division course sections taught by adjunct faculty, instructors, or teaching assistants each semester.
- _____ 19. Number of upper division course sections taught by adjunct faculty, instructors, or teaching assistants each semester.

Curricular/Program Issues

In some academic fields, requirements for the baccalaureate degree have increased to the point where it is impossible to complete general education and major requirements in four years due to the rapid expansion of knowledge, professional accreditation requirements, or certificate or licensure requirements. Admissions requirements for limited access programs have also become more stringent. On a scale of 1 to 5 please rate the degree to which the following curricular and program issues contribute to extending the time undergraduate students in your department take to graduate.

No Contribution		Moderate Contribution		Strong Contribution
1	2	3	4	5

- _____ 20. Knowledge explosion--rapid growth in the body of knowledge associated with the discipline which increases the content and complexity of courses.
- _____ 21. Degree requirements--includes credit hours required to graduate, sequenced course obligations, core curriculum requirements, and experiential learning situations.
- _____ 22. Requirements placed on academic programs by professional associations which accredit the program and/or certificate and licensure requirements.
- _____ 23. Admissions requirements for limited access programs.

Logistical Issues

Facility and scheduling challenges contribute to logistical problems. On a scale of 1 to 5 please rate the degree to which the following logistical issues contribute to extending the time undergraduate students in your department take to graduate.

No Contribution		Moderate Contribution		Strong Contribution
1	2	3	4	5

- _____ 24. Scheduling of classroom space--size and number of rooms available.
- _____ 25. Timing/sequencing of courses offered each semester.
- _____ 26. Number of course sections offered each semester for general education and Gordon Rule courses.
- _____ 27. Liberal nature of course drop and/or withdrawal policies.
- _____ 28. Absence of a grade forgiveness policy.

Please make comments on additional institutional factors you feel influence undergraduate students' time to graduation.

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BIOGRAPHICAL SKETCH

Meaghan Ann Brune was born and raised in Baltimore, Maryland. She attended Bucknell University in Lewisburg, Pennsylvania, where she received a Bachelor of Arts degree in international relations in 1984. After graduation, Ms. Brune worked for two years in admissions at the College of New Rochelle in New Rochelle, New York, before returning to school to pursue a Master of Business Administration degree. She was awarded her MBA from Wake Forest University in Winston-Salem, North Carolina, in 1988.

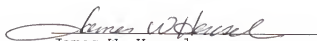
Ms. Brune worked as a residence life coordinator at the University of Georgia from 1988-1991. She has been employed as an Assistant Director of Housing at the University of Florida since 1991 where she has worked full time while pursuing her doctoral degree.

Ms. Brune is active in a number of professional organizations including the Southern Association of College Student Affairs, the Southeastern Association of Housing Officers, the Association of College and University Housing Officers--International, and the National Association of Student Personnel Administrators.

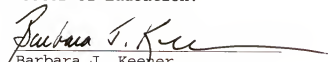
I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.


David S. Honeyman, Chair
Professor of Educational
Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.


James W. Hensel
Professor of Educational
Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

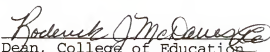

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.


M. David Miller
Associate Professor of
Foundations of Education

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Education

May, 1996


Dean, College of Education

Dean, Graduate School